BULLETIN OF THE

TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

> ORGANIZATION is the formation of an effective machine; management, of an effective executive; administration, of an effective direction. Administration determines the organization; management uses it. Administration defines the goal; management strives towards it. Organization is the machine of management in its achievement of the ends determined by administration.
>
> —Sheldon

Engineering Societies Building
29 W. Thirty-Ninth St.
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AUGUST, 1923 VOL. VIII., NO. 4

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Published by the Taylor Society at
Engineering Societies Building
29 West Thirty-ninth St.
New York

Copyrighted 1923, by the Taylor Society. Published every other month. Per Year to Members, $2.50; to others, $3.00. This Issue $.75

Entered as second-class matter, Dec. 17, 1921, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

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COMMENT

BY courtesy of the *Harvard Business Review* we are privileged to reprint a noteworthy article which appeared in the July issue of that review; "The Control of an Industry in the Business Cycle," by Howard Coonley, president of the Walworth Manufacturing Company, Boston. It is the description of a system of budgetary control which has yielded striking results. In connection with this article the attention of readers is called to the article "A Technique for the Chief Executive," by John Williams, published in Vol. VII, No. 2, April, 1922, of the *Bulletin,* and the article "Budget Control" by George E. Frazer, published in Vol. VII, No. 3, June, 1922.

THE striking thing about these articles is the essential identity of basic principles; for instance, the necessity for any effective budget control of a clearly defined organization and clearly defined executive responsibility. Says Mr. Frazer: "The first phase of budget control that should be discussed is responsible organization. . . . There can be no budget control, no policy continuously established, without a line of authority to assist the principal executor . . . the whole idea of a budget, to my mind, is a set of estimates as to future accounts that will reflect the policies of the company as a guide to those who have definite responsibilities in executing the policies." We find Mr. Williams saying: "If the organization chart represents the units of responsibilities and duties upon which the success or failure of the enterprise depends, then obviously it represents the units in which all costs and records should be kept" and in which budget estimates should be made. Quoting from Mr. Coonley's article: ". . . there was also in progress a simplification of the organization. It was not an easy matter at first to define clearly the functions of the major executives . . . each being given full authority in the direction of all activities within his control, and being held responsible for financial results, which our revised accounting system makes it possible to segregate."

IN every new case of a noteworthy accomplishment with respect to some phase of the management problem, we find striking confirmation of basic principles which have been stressed in the programs and publications of the Taylor Society. Clearly-defined policies and plans; a clear-cut organization without over-lapping of responsibilities and authorities; clearly-defined responsibilities and authorities; plans, estimates, standards and records in terms of clear-cut organization and defined responsibilities;—find for us a noteworthy case of budget control not based on these principles! These are principles, it should be noted, which have been carried over from the code of good detail shop management; were basic principles of scientific management years before general management, the management of the business as a whole, had begun to question itself concerning its over-all management responsibility and its ways and means. We hail every new noteworthy achievement, examine it, and discover that it is a new center of sense and nerve in adopting and adapting good scientific management principles. Taylor's "Shop Management" is the classic on budgetary control as well as on shop control—to the executive with imagination.

"Shop Management" presents a scheme of definite tasks for each machine; the mind of the reader with imagination pictures a department as a machine with a definite task; the book presents a scheme of current checking of the accomplishment of each machine with respect to its definite task; the mind of the reader with imagination pcitures a scheme of checking the accomplishment of each department's definite task; and then it pictures the checking of the definite task of the business as a whole; and so on. The basic principles are in the book.

WHILE out of American industry have come the revolutionary developments in management, and while many executives from across the Atlantic are coming to this country to examine into them, we are sure there is no ground for any condescension on our part. Our European friends move slowly—because they have to—but they move exceeding well. They do a deal of thinking before every move. There is undoubtedly more study and discussion of scientific management in Western Europe than in the United States, and in due time the results will be manifest. There has recently come to this country a little book, Sheldon's "The Philosophy of Management," by an Oxford graduate now on the staff of a large industrial concern. The book is not revolutionary in content; it presents no great discoveries. It is a good Taylor book throughout, although it mentions Taylor and scientific management infrequently. Its sources are sources influenced by Taylor but secondary to Taylor. But for a careful thinking-out of a philosophy of management we believe it is unexcelled. We believe that it is the first work on management which can properly use the word *philosophy* in its title.

SOME weeks ago we received an aerogram from an English firm to send at once half a dozen copies of a *Bulletin* containing a certain noteworthy article. Recently the executive head of that concern has been in this country, and we asked him about the reason for the rush order. He laughed and said: "I read the article and it struck me as having so much of fundamental importance that I instructed the heads of departments to study the article and be prepared for a conference upon my return from America. You know, we don't go into conference without preparing on what we are going to discuss. By the way, will you give me an introduction to the man who wrote that article?" Now the circumstance set us to pondering, and we asked ourselves several questions: How many American major executives among our subscribers (over a thousand) had *found time* to read the article? We know of a few, but only a few. How many American executives had rated it as of importance enough to warrant a conference preceded by a careful study of the article by each department head? We do not know of any. How many American executives had asked us for an introduction to the author? None.

RELIEVING OUR PRESIDENTS

THE death of President Harding, following the breakdown of President Wilson, has caused a turning of thought to the problem of relieving the President of part of his burden. One suggestion would divide his responsibility and authority; another would make him ineligible to a second term; another would restrict his travel. All such suggestions are superficial.

The problem is one of proper organization and involves principles in no wise different from those which must be observed in proper organization for the conduct of a private enterprise. There must be recognized in organization for and procedure in public enterprise, that same distinction of major functions necessary in the ordinary private enterprise; *the distinction between policy determination, management and detail execution.*

For *detail execution* there must be built up a stable operating force of competent individuals. Each should be trained for his or her respective function, should be held to strict accountability for excellence of performance in accordance with formulated standards, and be subject to removal or transfer according to performance. The adoption of this one principle would relieve the President and members of the Congress of three-fourths of their present "burden." It would free them for attention to the more important matter of national policy.

For *management* there should be a body of competent executives—comparable, if you please, to the department heads of a private enterprise—whose function should be the translation of general policy into working plans and programs and the direction and inspection of detail execution. They too should be judged by standards of service which it is not impossible to formulate, and their service should be reasonably permanent. The recognition of this principle would further relieve the President and members of the Congress of "burden," and would further promote greater attention to policy determination.

For *policy determination* there is left—the President and the Congress. Determination of policy and general responsibility for the securing (not the detail directing) of efficient execution constitute their proper function. The President would be assisted by executives—cabinet members, major executives not concerned with details but comparable to "vice-presidents in charge" in private enterprise—appointed by him and removable by him. Giving their exclusive attention to policy and to ways and means of executing policy, more of our Presidents would be statesmen, as would also perhaps an appreciable number of members of the Congress.

Then presidents should play golf more, instead of less; spend more restful hours on the *Mayflower*, instead of fewer; travel more and talk to the people more, instead of less, concerning questions of national policy. They should be subject to re-election, for re-election would mean approval of wise policies and effective general administration instead of reaction to political manipulation.

Organization and procedure along these lines would not require constitutional changes; but would require a profound change in mental attitude.

POLITICS vs. GOOD MANAGEMENT IN PUBLIC AFFAIRS?

ONE day last spring the Secretary of the Interior called in Arthur P. Davis, Director of the United States Reclamation Service, and demanded his resignation within two weeks. No adequate reason was given and Mr. Davis declined to resign. Thereupon the Secretary exercised his authority, dismissed Mr. Davis, and appointed a western "business man" in his place.

Mr. Davis, a trained engineer and competent executive, had been many years in government service. He had directed the affairs of the Reclamation Service in a competent manner, not only from the engineering point of view but also from the point of view of the detail business problems involved. As an example: In connection with the construction of one of the great conservation dams he had believed the bids for supplying cement too high; he solved the problem by building a cement plant on the site, raw material being available, and saved the government a large item of expense. Throughout his conduct of the office had been after this fashion. No specific charge had or has been brought against either his engineering or his business ability.

As successor there was appointed, on the ground that the Reclamation Service could better be administered by a "business man," a man without noteworthy record for success in business but who had been more or less active in regional politics. Are "business man" and "politician" synonymous in the Secretary's vocabulary?

Two aspects of the situation are especially interesting:

At a time when industry is to a greater extent every year calling upon trained engineers with executive capacities to head industrial enterprises, the Department of the Interior dismisses a technically equipped man with proved executive ability from the direction of an agency of the government essentially technical in its nature;

The only serious criticism of Mr. Davis' business direction of the Reclamation Service had been by certain interests in the West who had endeavored to secure a reduction in or had endeavored to repudiate payments for reclaimed lands purchased. Should the Secretary's interpretation of the function of a "business man" be to conciliate these interests, then public confidence in the administration of the Reclamation Service would be seriously impaired.

Because of the far-reaching results which might ensue, the organized engineers of the United States are preparing to make a thorough search into the considerations which led to the action taken by the Secretary of the Interior. The American Society of Civil Engineers has appointed a special committee to investigate the matter. The Public Affairs Committee of the Federated American Engineering Societies is awaiting a reply to the following letter of inquiry addressed to the Secretary:

June 24, 1923.

Hon. Hubert Work,
Secretary of the Interior,
Washington, D. C.

My dear Mr. Secretary:

The Federated American Engineering Societies has a membership of twenty-eight local, state and national engineering societies, the combined individual membership of which is 50,000. The organization was designed for the purpose of enabling the engineers of the United States to render an essential public service, particularly in relation to engineering matters.

The officers of the Federated American Engineering Societies are much concerned with the recent announcement relative to one of your Bureaus, the Reclamation Service. We are advised that you have requested the resignation of the Director of the Reclamation Service, an engineer; have abolished the position, and in his stead have appointed a business man to fill the newly created position of Commissioner of Reclamation, it being reported that you have decided that a business man should more capably direct this Bureau than an engineer.

While we do not question your right to discharge anyone you may elect, yet we do look with grave concern upon placing in charge of a technical bureau one who is not technically trained and fitted. We, therefore, desire to become as fully acquainted as possible with the consideration that led you toward this action and would most respectfully suggest that an early statement from you might possibly clarify the situation before our officers.

Respectfully,
L. W. Wallace,
Executive Secretary.

THE CONTROL OF AN INDUSTRY IN THE BUSINESS CYCLE[1]

By Howard Coonley[2]

HUMAN nature decrees that every executive shall believe his business to be surrounded by more difficulties and intricacies than could possibly exist in any other enterprise. Claiming no exception to the human rule, I am confident there is no more delicate problem of production and inventory control than that of the Walworth Manufacturing Company. As producers of pipe fittings, valves and tools made of cast iron, malleable iron, brass and steel, we are required to have ready for shipment at any time something over 23,000 different finished articles. In terms of completed parts this means several times that number of items.

Our product goes to the building trades, to manufacturing plants, to the railroads, shipbuilders, oil fields, and in fact to every line of activity, in quantity. Although new construction of buildings and equipment of all kinds plays a large part in our demand, by far the greatest tonnage is used in repair work, and therefore we are unusually subject to the necessities of quick delivery. We distribute this product, approximately 50,000 tons of finished material, through six of our own branches located in the largest distributing centers and through large jobbing and manufacturing customers.

We have two factories, one in South Boston which produces under normal conditions something over 1,000 tons of finished goods a month, and in Kewanee, Illinois, a larger unit producing normally something over 3,000 tons monthly. South Boston Works ships to the territory east of the Alleghenies and to our export customers; Kewanee Works covers the territory from the Alleghenies to the Pacific Coast. In general, the assortment of material produced at both plants is approximately the same.

At the time of my becoming president, the Walworth Manufacturing Company in 1913 had only one plant located in South Boston and their sales were approximately 15 per cent of our present volume. Since the number of items which they were producing and storing was the same as at present, their production and inventory problem was fully as difficult. The methods used in ordering material were characteristic of those followed generally at that time—namely, to give a blanket manufacturing order to the superintendent when a shortage occurred and leave to his off-hand decision the determination of the quantity to produce. There was available no background of records on which to predicate a planning system. Figures showing the company's condition were available only once a year. No estimate was possible of the current monthly profits and there was no classification of the product.

I. Development of Cost Accounting

Realizing the vital necessity of a more definite system of accounts to make possible an accurate method of control, we determined as a first step to divide our product into major classes and to use this classification in all our accounting. As a second step we decided to reconstruct our sales and production records over as long a period as was practical, and to use this information as a basis for a budgetary system. The necessities of war and the changes in the company's activities delayed the time at which our budgetary system could be started and it was not until the year 1922 that we obtained the full advantage of control methods which are now a permanent and basic part of this company's policy.

For purposes of both accounting and production control, we had decided to divide our product into fifteen groups and to break these groups down into thirty-eight classes. From the time materials are put into production to the time they are billed to our customers, these classifications are maintained. By use of these classifications through the summary accounting records, we can follow the movement of goods, through raw material and work in process, until they have passed out of our control into the market. The simplicity of such a cost accounting system is one of the great aids to interpretation of the productive processes going on within the company.

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[1] Reprinted by permission from *Harvard Business Review*, Vol. I, No. 4, July, 1923.

[2] President the Walworth Manufacturing Company, Boston.

II. Changes in Organization

While this simple cost accounting system was thus being developed, there was also in progress a simplification of the organization. It was not an easy matter at first to define clearly the functions of the major executives. Of course, as is the case with many companies who first approach such a problem in organization, it is found that many persons are attempting to do the work which others feel should come within their jurisdiction. Lack of definition is bound to bring about much overlapping of duties. When this overlapping was eliminated from the major functions, we arrived at an organization showing three line vice-presidents—one in charge of production, one in charge of sales, and a third vice-president in charge of all administrative functions. And since our business has many technical aspects, a fourth vice-president in staff capacity heads up all functions pertaining to engineering. There are also, of course, the other usual corporation officers—secretary and treasurer. Therefore, six officers in contact with the president's office assume control of all branches of the business, each being given full authority in the direction of all activities within his control, and being held responsible for financial results, which our revised accounting system makes it possible to segregate.

It was naturally necessary in turn to break down the activities coming within the jurisdiction of each of these vice-presidents, so that every subordinate would know his authority and responsibility. The major executives under the Vice-President in Charge of Production, for instance, are the Boston Works Manager and the Kewanee Works Manager. Under each of these managers is a complete but distinct organization, and the accounting system is arranged to correspond with the authority of these officers. Each works has its own accounting records based upon the division into fifteen groups and thirty-eight classes, so that we may check costs and efficiencies between the two works on a comparable basis.

This plan of organization and the development of an adequate cost accounting system had but one ultimate end in view. The company, which was developing rapidly, must for control purposes be just as easy to comprehend as the original smaller organization. Responsibilities must be so clearly marked that there could be no sidestepping the results as indicated by the accounting records. And thus was laid the foundation for a budgetary control which should make possible a ready indication of the present status of the business and its future trend.

III. Relation of Walworth Business to the Business Cycle

Now as this development was progressing, the facts about the business, which had been simply guessed at before, began to accumulate and shape themselves into definite "rules of the business." We began to see that there was some rhyme and reason behind the past fluctuations in the business, and before long it seemed wise to inaugurate a statistical section which could run over the gathering figures and interpret them. Just how extensive the activities of this section would become was not definitely laid down. At first it was simply thought that something could be accomplished toward finding out where the Walworth business stood with relation to general business. Some publicity was being given at that time by certain economists to the theory that each business had its own cycles just as distinctly as general business. These economists suggested that any industry might find out its own cyclical changes and learn whether its movement was severe or easy. Furthermore, they suggested that the individual industry would probably find that its cycles corresponded in point of time with the cycles of business in general. It might discover that its particular volume reached its high or low point earlier than general business; or again that the general business situation developed a definite number of months in advance of its own varying conditions. But the first and most important suggestion they made was that if each business knew that it was affected in response to general business conditions, and could establish its position with regard to the general business movement, it would have a sure index of changes of policy that should be made to meet its own changing conditions.

This suggestion was in line with our own attempts at more definite control, for with the newly established organization and accounting methods to give us the facts, we needed only an indicator to tell us how to make maximum use of them. So the Planning and Statistics Section had cut out for it an initial field of activity. The facts already at hand, compiled by the accounting department, became its raw material, and even though the accounting plan had not yet been fully developed, there was much work that could profitably be done.

The first experiments showed that a Walworth cycle did exist and that it was very marked. A curve representing this cycle action by a very simple statistical process was worked back as far as 1890 on the basis of records available in the treasurer's office. There seemed to be a fairly logical sequence over a period

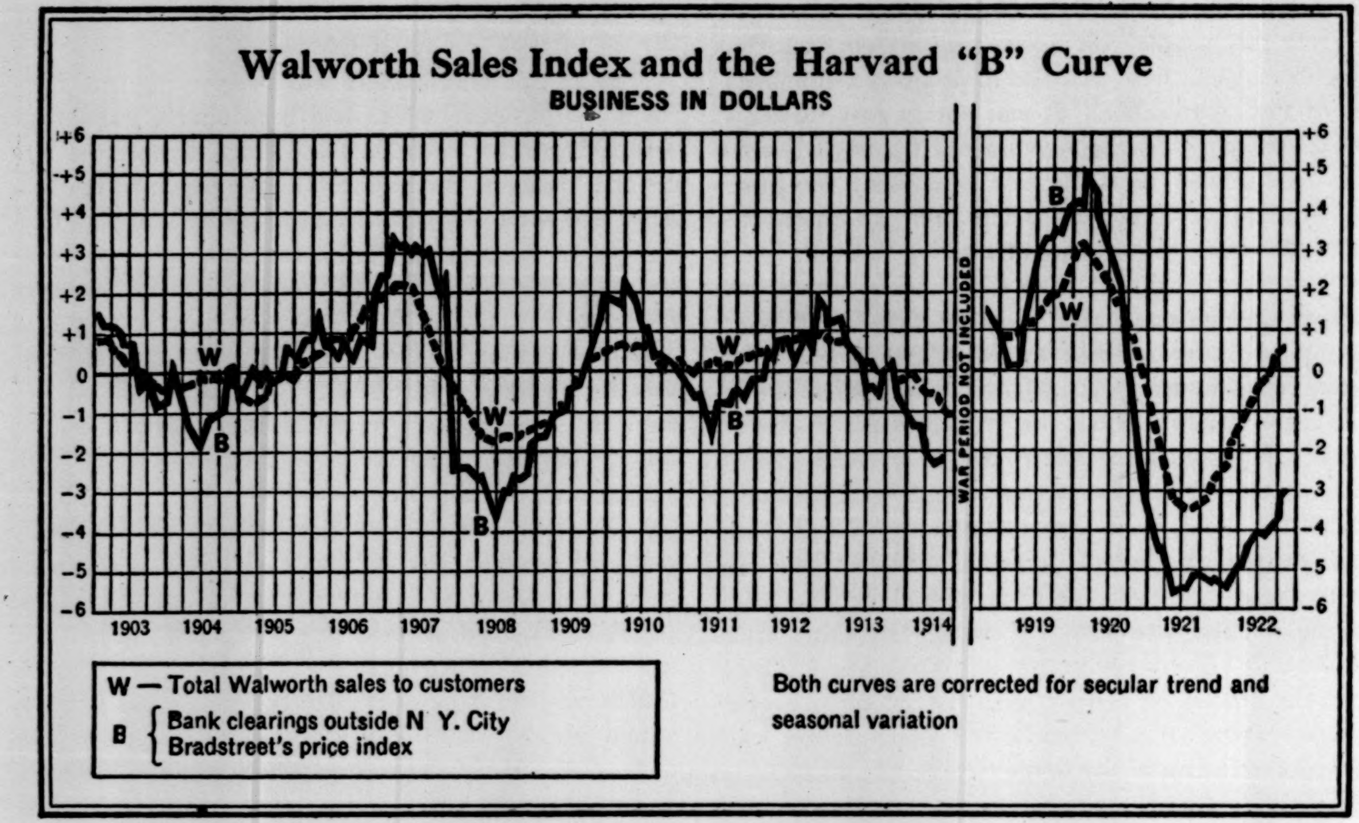

Chart 1. Walworth Sales Index and Harvard "B" Curve.

of a few years, and this sequence seemed to repeat itself continuously. It is true that there was no definite clock-like action in the length of time consumed by our business cycles, but there was a very definite cycle movement. The theory of the economists seemed to be working itself out in practice.

There had been for some time many advice letters coming in from business forecasting agencies, which had been read with the usual casual interest by most of the executives. The Planning and Statistics Section requested that all these letters, after they had been read, be forwarded to its files so that at leisure they might be reviewed and made further use of. Instead of going into the waste-baskets of the executives, these letters became the text-books of our investigators. As the staff became better acquainted with the good advice available, it seemed unprofitable not to make some tangible use of it. A very short study, in fact, made it apparent that our effort would be successful.

In every instance we found some similarity between the Walworth business curve and that of the barometers under investigation. The variation was greater in some instances than others, but there were in each some comparable elements. We did not, at the time, hope to find any curve which exactly paralleled our own. But we felt that if we could discover one which in the past had preceded or followed our own by a definite period, we could then accept the advice which that agency might give and adjust our plans forward or backward the exact number of months suggested by past experience. It was essential, however, that the number of months be very definite in order to provide a sound basis for policy planning and control purposes.

It was with great satisfaction, therefore, that we began our study of the Harvard Economic Service issued by the Harvard University Committee on Economic Research. Their method of presenting business cycles seemed at first a little technical, but a short study proved it easy to comprehend, and their charts indicating current status of business were much more definite in their forecasts than any others we had found. It was but a simple matter to change our cycle curve to a form which would enable a comparison with the Harvard B Curve. The accompanying chart illustrates how this was accomplished. Figures for the same 12 pre-war years covered by the Harvard B Curve were available. The war threw all barometers so far out of line that we did not attempt comparison during that period, but picked up the thread in 1919. It is generally conceded that more is to be learned with reference to normal business cycles from the pre-war years than from any later ones, and fortunately our records, though meager, supplied sufficient data to plot our line back to 1903.

There are three index lines on the Harvard chart and it would have been possible to attempt to compare our curve with any one of these. Had our business been speculative in nature, it would have been better to attempt correlation with the Harvard line representing speculation; or had it been primarily financial, we would have turned to the banking index for our comparison. But our industry is one of the bread and butter type of average business, so that it was evident from the first that the composite of the factors that control general business, the Harvard B line, was the one we should follow. The chart will show that our study was rewarded by finding an astonishing similarity between this B Curve and the Walworth line.

It is probably a matter of coincidence that our high point comes in almost exactly the same month every time as the B line high point; and our low point is reached in almost the same month as the low point of the Harvard B line. The only exception to this seems to be that in the years 1903-1905 we had two low points, with the "half high" point in the middle of 1904. We did not trouble ourselves to explain why we acted differently in this case from general business. Possibly in the middle of 1904 the company cut prices too low and got in some extra business, but if some exceptional reason like this had been eliminated so that the sales were evenly distributed over 1903, 1904, and 1905, the low point would have accurately tallied with the B curve. The important fact which we observed was that this condition held true after as well as before the war. So again we found greater confidence in the Harvard curve than in the other barometers, because no other that came to our attention showed a clear-cut cycle action in general business resumed in 1919, while the Harvard curve made evident the fact that the normal cycle was resuming its activity in that year.

A close study of the chart will bring out one essential difference between the pre-war and post-war curves—particularly in 1921 and 1922. There is now a faster rise in the Walworth than in the Harvard curve. We are beginning to think that this is due to our more effective planning and consequent prompter shipment of our merchandise after receipt of orders. In those earlier days there was hardly a choice but to accept the orders as they were offered and then to arrange to produce the goods as soon as physically possible. Since we are now able to forecast demand we can manufacture to meet known requirements, and have speeded up to a marked degree the shipment of orders as they are received. This means that our index line, which is based on billings, will probably move ahead of the B line instead of with it. Of course time is necessary to determine this to be a fact.

So we discovered that the second suggestion of the economists also found application in our practice. We had not only a business cycle of our own, but our cycle had a definite measurable relation to that of general business. And we were, therefore, in position to use in a very tangible way the forecasts which constantly passed through the Planning and Statistics Section. For instance, very definite predictions are given for a full calendar year in advance as to the action that may be expected for this Harvard B line. And their forecasts in turn are fairly well substantiated, at least as to general probabilities, by the other forecasting services.

IV. Application of Cycle Theory and Data to Walworth Planning

In the summer of 1921 we had our first opportunity to make use of our discovery. The Harvard B line gave definite assurance that general business was scheduled for an advance. Even when we were not prepared for it, our records showed that we had followed closely the general business trend. What could we accomplish if we prepared for the increase in advance? Industry had just been through a bitter experience that made executives unusually cautious. But we had become firmly convinced by our studies, and such doubt as remained was finally brushed aside by further unquestioned evidence. At about this time the Planning and Statistics Section solicited from the F. W. Dodge Company full information on building contracts awarded. It was thought that the statistical barometers of that activity should prove very enlightening to a business such as ours, because of the nature of our product, which is so largely used in building construction. Again our business cycle curve was lined up with the cycle activity shown by the building figures, and there seemed to be in this case not only a direct relation between our curve and the building curve so far as time of cycle changes was concerned, but also there was a very definite suggestion as to the extent of our business variation. Each year that building was ahead a given percentage over the previous year, our business seemed to go ahead by the same amount in the same year; and each

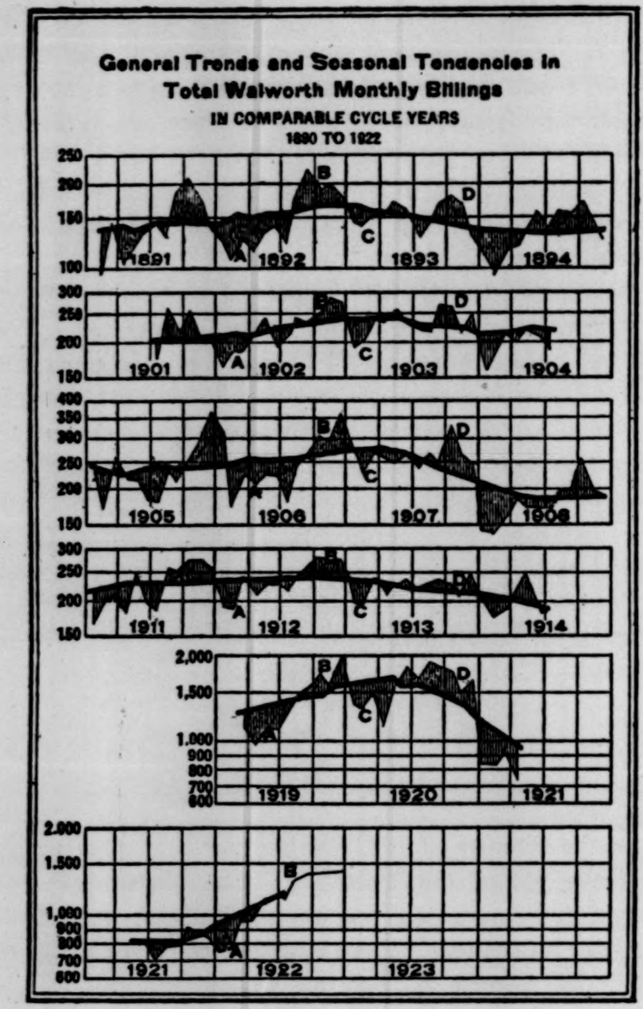

Chart 2. Comparison of Seasonal and Cyclic Fluctuations.

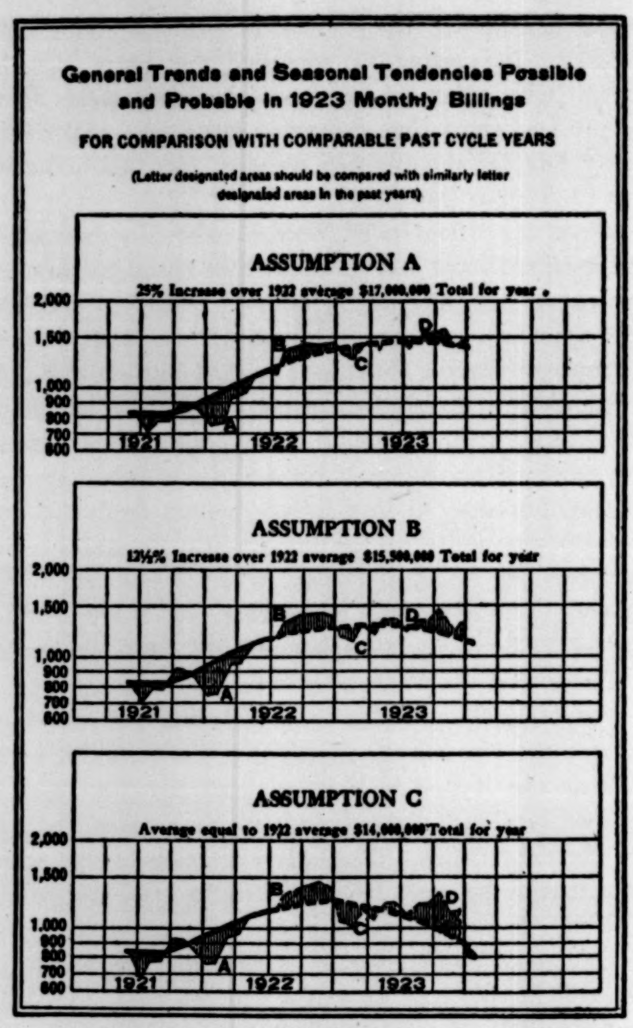

Chart 3. General Trends and Seasonal Tendencies Compared —Three Assumptions.

year that building fell off by a certain percentage, our business decreased by the same percentage. We did not infer from this that building was the cause of Walworth demand, but rather that the same cause which determined an advance for Walworth, determined an advance for building. It was a case of the mathematical proposition that things equal to the same thing are equal to each other, so that the forecasts for building were very serviceable as a forecast for Walworth activity. Thus we had selected one outside barometer to indicate the length of time our curve might continue in its present direction before turning, and a second to suggest the degree of its elevation. As an illustration of how valuable such forecasting has been to us, it may be here mentioned that our estimates of sales for 1922 were figured at about 42 per cent increase over 1921. As a matter of fact, building in 1922 advanced over 1921, 43 per cent and our sales were within .5 per cent of the forecast amount.

It was mentioned earlier that our business went ahead within a calendar year by the same percentage that general building activity advanced in the same calendar year. It is perhaps well to explain that in our business we must consider calendar years only. Our demand is so seasonal that in estimating the amount of business to be expected during any given set of months we cannot ignore the fact of the influence of seasonality within those months. For instance, the drop of January sales from December sales is 35 per cent, averaged over a series of ten years. This means that in some the drop is as high as 50 per cent and in an exceptional case, 60 per cent. This is our seasonal variation at its worst, to be sure. However, from January there is a gradual rise to March with some falling off in April. May and

June resume the stride set by March with again a decline in summer. But September tends to reach the March figure with the October figure normally much higher than March. November and December vary somewhat, but the average is for November to be slightly lower than October, and December the best month of the year. It is unusual if the business cycle increase or decrease from one year to another is greater than 20 or 25 per cent. Therefore, the seasonal influence is the greater, and to obtain a clear picture of the Walworth cycle we correct the year for seasonal trends and leave the seasonal problem to be taken care of after the cyclical trend has been found.

As a matter of fact it is not a difficult task to correct the seasonal variation in order to find the cyclical trend. The second chart illustrates our method of showing both seasonal and cyclical variations, and is the chart we used to compare similar periods in the past with a view to arriving at our estimates for the year 1923. Two points are brought out clearly in this chart: First, that although the seasonal variation of one year is not exactly like that of another year, yet there is a marked similarity; and second, that in no instance can we find an exact parallel to 1923, for in none of these years did the trend line stay up high so long as we have reason to expect it to do in the present year.

It will be noted that the chart displays a surprising similarity in the last half of the years 1892, 1902, and so on, which were found comparable to 1922, particularly in their seasonal tendencies. In every case a sharp recovery has taken place, the last months being far in excess of the January and February volume. In the same way we find the year following showing a decided downward trend, in one instance the November and December figures showing quite as low as January and February.

For a number of reasons we were able to draw forward our sales index line with some confidence. The number of months we might expect the line to remain at high levels was very definitely forecast by outside agencies. Again, the amount of increase beyond 1922 was fairly well suggested by reliable figures. Finally there was a good background for plotting our seasonal areas to the trend line as we had extended it through 1923. This background was supplied by plotting out three "assumptions" and then by process of elimination using the most likely one.

The third chart shows these three assumptions, any one of which might seem at first to fulfill the conditions. But after superimposing on the cyclical trend the seasonal variations, it was evident that the second curve called "Assumption B" was much the most logical. Any volume of sales greater than that amount must be secured by greater efficiency in supplying the market through salesmanship, backed up by unusual cooperation of the works, and by complete utilization of the improved market facilities which have been provided for some of our merchandising units.

It was on the basis of Assumption B, therefore, that we laid out our preliminary production program for 1923. Naturally the sales estimate had to be broken down into class requirements and these compared with production facilities before even the preliminary control instructions could be issued. But having arrived at these class requirements we had a definite basis for setting up material and labor requirements, and for estimating financial demands.

It is not to be thought that this initial program for the year is adopted once and for all without current revision. So far as the production policy is concerned, there is established each quarter an estimate of actual sales requirements upon the two works as it appears at the time of making such a quarterly estimate. This quarterly estimate goes from the Sales Department through the Planning and Statistics Section to the Vice-President in Charge of Production, who uses it as a basis for formulating his quarterly production and purchasing programs, and for allocating the production between the two works. Nor is this the final step in the control. Each month before the existing production orders are completed or new ones are received, each works manager sends to the Planning and Statistics Section a statement of his proposed production by each of the classes for the coming month. These reports are coordinated and sent for review to the general office executives primarily interested, particularly to the Vice-president in Charge of Production, for final review. Although at this time some of the work may be in process, it is yet possible to revise the production downward and to curtail purchases to some extent if desirable, or otherwise to revise the actual policies for the current month.

V. Budgetary Control of Sales, Purchases, Receipts, and Expenditures

In addition to control of production, there are naturally many valuable adjustments that can be accomplished by advance information of the type we have discussed. The most valuable is provided by the monthly budget of sales, purchases, payroll, and cash which is our business thermostat. This budget serves

	Billing	Purchases	Payrolls	Cash Receipts	Cash Disbursements	Inter-Co. Billings	Inter-Co. Purchases
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
1 Gen. Off. Expense.....		$ 00,000.00	$ 00,000.00	$ 00,000.00	$ 000,000.00	$	$ 000.00
2 Eastern Div.	$ 000,000.00	0,000.00	0,000.00	000,000.00			00,000.00
3 Boston Works		000,000.00	000,000.00			000,000.00	00,000.00
4 Western Div.	000,000.00	0,000.00	00,000.00	000,000.00	000,000.00		00,000.00
5 Kewanee Works		000,000.00	000,000.00			000,000.00	00,000.00
6 Boston Branch	000,000.00	00,000.00	00,000.00	000,000.00		000.00	00,000.00
7 New York	000,000.00	00,000.00	00,000.00	000,000.00	00,000.00	000.00	000,000.00
8 Chicago	000,000.00	00,000.00	00,000.00	000,000.00	00,000.00	000.00	00,000.00
9 Seattle	000,000.00	000,000.00	0,000.00	000,000.00	00,000.00	00.00	0,000.00
10 Philadelphia	000,000.00	00,000.00	0,000.00	000,000.00	00,000.00	000.00	00,000.00
11 Portland	000,000.00	00,000.00	0,000.00	000,000.00	000,000.00	00.00	0,000.00
12 Total Branches	000,000.00	000,000.00	00,000.00	000,000.00	000,000.00	0,000.00	000,000.00
13 Wal. Int. Co.	000,000.00	00,000.00	0,000.00	000,000.00	000,000.00	000.00	00,000.00
14 Total	$0,000,000.00	$0,000,000.00	$000,000.00	$0,000,000.00	$0,000,000.00	$000,000.00	$000,000.00
15 Total Payroll		000,000.00					
16 Inter-Company				000,000.00	000,000.00		
17 Total	$0,000,000.00	$0,000,000.00		$0,000,000.00	$0,000,000.00		
18 Financial Exp.		(a) 00,000.00					
19 Total	$0,000,000.00	$0,000,000.00					
20 Capital & Other Chgs.		(b) 00,000.00					
21 Total	$0,000,000.00	$0,000,000.00					

(a) Financial Expense Includes $ 0,000.00 for int. on notes pay'ble
00,000.00 for int. on bonds (Book)
000.00 for insurance Chg. only
00,000.00 for special funds.
$00,000.00

(b) Capital Charges includes $00,000.00 Walworth Realty Co.

(c) None of the figures on the Budget indicate the effect of any proposed note transaction.

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Chart 4. Walworth 1923 Budget.

to control the expenses and finished material purchases of the merchandising units which deal considerably in resale items as well as Walworth materials. Further, this budget serves as the treasurer's advance notice of probable cash requirements several months in advance of the actual requirement date.

On the tenth of the month previous to the one under review, schedules are sent to every unit which makes sales and therefore collects money, or which purchases materials and therefore disburses cash. By the twentieth of that month these schedules are all received back in the office of the Planning and Statistics Section and are combined into a master budget sheet, letter-paper size. This sheet is designed, as shown in the first tabulation, to give a summary picture of the activities of the whole company. First billings, by units, are set over against purchase invoices to be received and accrued payroll, by the same units. Then there are set against each other cash receipts and cash disbursements, both by similar units. The first set of columns on the accrued basis suggests readily the relation between commitments and sales income. Because of our usual terms of credit these two columns very definitely suggest the probable cash conditions 60 days hence; and the company's total of commitments when compared with sales suggests the current month's profit. The two next columns, or the "cash" columns, suggest probable cash position during the following 30 days. From the treasurer's viewpoint, these cash columns will indicate the degree to which he may liquidate current borrowings from the banks, or the amount which he must provide to guarantee financing the inventory increase. Of course all this activity could not go on without inter-company exchange of goods, particularly from the works to the branches, so two more columns show, by units, inter-company sales and inter-company purchases.

From this "set-up" there can then be observed for each unit upon a single line across the sheet a summary of its condition as an individual entity. Sales to customers plus inter-company sales represent income. Purchases from outside vendors plus payroll plus inter-company purchases represent total commitments made for securing the sales of the month. Or, if there is any change in inventory, after a rough allowance for usual profit on sales, it is readily determined just how much each unit may be changing its inventory condition. Analysis in this form is carried out in the second table shown.

All Units (G. O. Regular Distributed to Sales Units.)	COMMITMENTS			SALES INCOME EXCLUDING PROFITS				1923 YEAR TO DATE EXCESS OF COMMITMENTS OVER INCOME (Approximating Increase in Inventory)				
	Purchases Incl. I/C & Chgs. from G. O. (Excl. Capital & otherChgs)	Total Payroll Charge	Combined Purch. and Payroll	Total Sales toCust. and Int.-Co.	Anticipated Profit		Sales Income Less Expected Profit	May to Date	April to Date		March to Date	
					Expected Per cent Profit Margin	Dollar Profit Am'ts		Visible as of 4/26	Visible as of 4/17	Visible as of 3/27	Visible as of 3/27	Visible as of 3/17
	A	B	C (A plus B)	D	E	F (D×E)	G (D−F)	H-5† (C−G)	H-4†	H-3†	H-2†	H-1†
1 East. Div.	$0,000.	$ 000.	$0,000.	$0,000.	0.0%	$ 00.	$0,000.	$ 00.	$ 00.	$ 00.	$ 00.	$ 00.
2 West. Div.	0,000.	0,000.	0,000.	0,000.	00.0%	000.	0,000.	000.	000.	000.	000.	000.
3 Boston	000.	00.	000.	000.	0.0%	00.	000.	00.	00.	00.	00.	00.
4 New York	000.	00.	000.	000.	0.0%	0.	000.	000.	00.	00.	00.	00.
5 Chicago	000.	00.	000.	000.	0.0%	00.	000.	00.	00.	00.	00.	00.
6 Seattle	000.	00.	000.	000.	0.0%	0.	000.	00.	00.	0.	00.	00.
7 Philadelphia	000.	00.	000.	000.	0.0%	00.	000.	00.	00.	00.	0.	0.
8 Portland	000.	00.	000.	000.	0.0%	00.	000.	00.	00.	000.	000.	000.
9 Total Branch	0,000.	000.	0,000.	0,000.		0.	0,000.	000.	000.	000.	000.	000.
10 Wal. Int. Co.	000.	00.	000.	000.	0.0%	00.	000.	0.	0.	00.	00.	00.
11 Grand Total	0,000.	0,000.	00,000.	00,000.		000.	0,000.	000.	000.	000.	000.	000.
*12 Capital Chgs. and other (Only G. O. Expen. not distributed to Sales Units)								*000.	*000.	*000.	*000.	*000.
13								$0,000.	$0,000.	$0,000.	$000.	$000.

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†The number following any column, identified by "H," suggests that the figures therein have been copied over from the "H" column of the first, the second, or later issue, of this tabulation.

***Capital and Other Charges include the following:**

January **$00. Munsing**
00. Wal. Realty
00. Phila. Realty
$00.

April **$00. Wal. Realty**

May **$. None**

$000. Total Capital Charges Listed.

February **$000. Income Tax**
00. Cleveland
00. Wal. Realty
$00.

March **$00. Preferred Div.**
00. Common Div.
00. Wal. Realty
$00.

Chart 5. May, 1923, Year-to-date Comparison of Commitments Against Sales Income.

Such a summary for budgetary forecasting and control would not, of course, be possible had not the earlier groundwork been prepared. The reason it is a simple matter to obtain from each unit head an estimate of his own budget is because he knows very definitely just what his jurisdiction covers, and can obtain from his accounting records, over at least two or three years, the basic data necessary for him to use in estimating the future.

And again we find an opportunity to improve this estimating, because it is possible to prepare, with the expenditure of but a few hours' time every week, a summary of actual figures, which show us, currently, how closely our performance is meeting the estimate. This weekly summary of the actual status of the company is also prepared on a letter-size sheet of paper. It is set up in exactly the same arrangement as the master estimate for the month so that direct comparison item by item and unit by unit can be made. It is readily discernible on the fifteenth of the month from the weekly master budget report coming out at that time, whether or not, for instance, our Chicago Branch is likely to spend more in the month than they first anticipated. The branch in such a case is supposed to have previously notified us that the estimate was in error. But the weekly reports would develop the situation automatically.

Immediately after the end of the month, approximately 15 days before the final detailed auditor's statements can be made available, the Planning and Statistics Section, from the current accounting sheets as they pass over the desk, abstracts figures for preliminary reports issued to the officers in charge of activities. These reports cover monthly tonnage of orders received, shipments and production, actual purchase commitments, payroll, cash receipts and cash disbursements. There are issued a few other preliminary, yet essentially accurate actual reports on activities necessary for current control. When the auditor has made out his detailed reports according to the accounting classification, the Planning and Statistics Section issues comparison letters for the various estimators. This is done so that the estimators may have the lump sum actual totals for the month, in the same form in which they estimate by items for future estimates; and also in order that they may know how far their actual figures vary from the estimate. When some exceptional condition causes the variation between the actual and the estimate, this is explained by the Planning and Statistics Section, but ordinarily the estimator is expected to find the reason for himself and to send in his own explanation.

Perhaps the thing that is most significant in our budgetary system is the simplicity with which it has been possible to operate it. The present work is carried on by three clerks in the general office. The budget is of such a nature that it groups itself into two rush periods during the month, and this makes it possible for the same group of clerks to do the necessary research study when the actual budget work is not pressing. It has not yet been necessary to search for figures that were not readily available from the accounting system as it had been developed with a view to budgetary control. With the records accruing from the initial accounting, it has required but little rearrangement and interpretation of the facts at hand to present them in form for application to budgetary needs. Yet this is one of the greatest benefits to be derived from the budgetary procedure.

It is quite generally conceded by those who first had objections to estimating for the Master Budget that they would not now consider giving it up. One of these executives, who had thought that time given to budget estimating would be wasted, has since said that he now realizes that he never before had a real grip on his job. The requirements upon him to estimate the future have forced him to analyze the present. There can be no question that every executive of our company has a knowledge of his duties that he never had before.

VI. Conclusion

Were I unfamiliar with a control system of this type and reading a crude outline of this kind, I am conscious that I should be saying to myself, "All this is very well, but what does it accomplish? This may be a good recipe, but 'the proof of the pudding is in the eating.' What has the budget really accomplished for the Walworth Manufacturing Company?"

Here are the results for the year 1922: Our actual sales came within .5 per cent of our estimate. Cumulatively the first six months were 8 per cent in excess of the estimate; the first nine months were 4.3 per cent, but the full year's figures were so close to the estimate as to be a coincidence. We do not expect again to equal this particular record. We have reason to believe that the earlier months of the year were thrown out of line because of our increased ability to ship promptly. Having advance information, we were able to decide on a production plan that would give us an even flow of material throughout the year, building up our stocks in the spring and summer months to meet the fall demand. This accomplished not only better service to our customers but greater economy of production, more even employment for our workmen, and a great decrease in labor turnover. It enabled us to anticipate our material requirements and to take advantage of low price conditions. It gave our treasurer exact information as to financial requirements. It made it possible for me to place before our directors a definite estimate of the amount of money that would be involved in producing in advance the excess stock necessary for fall delivery, and it justified them in adopting the program because I could assure them that this investment could be liquidated before the end of the year. It enabled us to set up an ideal inventory for the end of the year and to work toward final liquidation to this ideal point. It proved that this inventory control was practicable because we came within the limit set by my office.

Of all these benefits, probably the greatest has been our ability to operate on an even basis throughout the year. Under the old conditions we would have produced 16 per cent of our total requirements in the first quarter; 22 per cent in the second quarter; 28 per cent in the third quarter; and 34 per cent in the fourth quarter. In 1922 it was possible to approximately equalize the quarterly production figures. In these days when seasonal employment is one of the country's greatest problems, when labor turnover is great and when an actual shortage of labor has occurred, continuous employment at fair wages is the stimulus to the good workman that no temporary attraction can equal. Carried over a period of years it will secure the type of labor that makes for economy and efficiency. This does not mean of course that we can counteract the cyclical fluctuations. The fact that we are able to take care of this problem within each calendar year is a substantial step in the right direction.

Budgetary control is now one of the fundamental policies of the Walworth Company.

THE TIE-UP OF SALES AND PRODUCTION[1]

By L. J. Conger[2]

THE subject under discussion, the tie-up between sales and production, is one which has so many ramifications and is approachable from so many different angles and under such varying conditions that it seems obvious that for our purposes we shall be obliged to confine ourselves to one or two special phases rather than to attempt to treat the entire field. You will understand to what I refer when I call your attention to the fact that general production policies vary with relation to the article or articles manufactured in that some are made only to order, some are made only for stock, some factories of necessity adopt both policies, and even then we have not covered the immense field presented by manufacturers of staple commodities rather than specialties. For our purpose I have taken the liberty of confining what I have to say on the subject to a general consideration of the whole field rather than specific consideration of the various production policies cited.

The proper solution of a practicable and efficient tie-up between sales and production presents three distinct problems. First, a satisfactory and scientific budgeting of sales possibilities; second, an efficient and workable budgeting of production; and third, a proper control of the balance between the sales and production budgets. It seems to me that a logical treatment of the subject under discussion necessitates consideration of the first two problems separately, and of the third as to satisfactory cordination of the solutions reached under the first two heads. This conclusion is logical because it is obvious that unless we know something about sales possibilities we cannot reach any definite conclusions as to sales requirements and unless we have a proper control of production we cannot satisfy sales requirements. It is evident that there can be no coordination between budgets if there are no budgets, and it is equally evident that unless our budgeting methods are reliable the conclusions drawn from them will be worse than none at all. I shall, therefore, in the following discussion consider sales and production budgets and their relationship in the order named, and I shall take the liberty of laying particular emphasis on the selling phase for two reasons; first, because I am more familiar with it than I am the production; and second, because methods for obtaining production budgets are pretty well standardized and need no extended treatment. Because of my unfamiliarity with the methods used by concerns other than the Corona Typewriter Company, I shall take the liberty of basing whatever conclusions are reached largely on Corona's experience with the hope that you will possibly be able to apply some of our ideas and methods to your own problems.

Methods for the scientific analysis of sales possibilities and potential markets have been so poorly developed that they admit of practically no discussion in the light of experience. In fact, they are far behind production analysis methods. The industrial world owes an immense debt to the Taylor Society for the development of practical solutions of production problems, and if the work which the Society is now starting with respect to a similar development in sales work is reasonably successful, the debt will be increased many fold. In fact, one of the most encouraging phases of the whole matter is the recognition by members of the Taylor Society of the need of sales analysis, because it is obviously impossible to strike a proper balance between two considerations or two parts of a problem when much is known of one and practically nothing is known of the other. But sales interests fortunately are recognizing their utter ignorance of scientific analysis and are groping for light. The tie-up of sales and production depends almost entirely for its solution on the development of analytical sales methods, and not until data for such analysis is developed to a point at least approaching that of production analysis can we hope for a satisfactory solution of the sales and production tie-up.

Sales interests are fortunate in having a foundation on which to build analytical methods. The Taylor

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[1] A paper presented at a meeting of the New York Southern Tier Section of the Taylor Society, Watkins, N. Y., July 14, 1923.

[2] President and Sales Manager, the Corona Typewriter Company, Inc., Groton, N. Y.

Society and allied organizations have laid that foundation because there is no reason why sales analysis should not follow almost exactly the lines of production analysis. It is a scientific problem and we sales executives must recognize that fact before we shall get anywhere. We must eradicate the idea that the human equation controls sales results, or at least we must recognize the human equation only so far as production analysis recognizes it. Production is dependent on labor, its whims and eccentricities, just as fully as sales. We are all working with people, and people in the mass are largely a constant in any formula, be it concerned with its physical manifestations in production or its mental reactions as in sales. That, it seems to me, is the first requisite to a proper grasp of sales analysis and the relation of sales to production.

In the Corona sales organization we have a rather peculiar state of affairs to handle. I suppose almost any sales executive could honestly and sincerely make the same statement in relation to his particular product, but in many instances products are specialized in their application, such as office equipment products like adding machines, addressing machines, or such as electric cranes and hoists. Their field is limited to certain specific uses and locations, while Corona makes its appeal to practically every man, woman, and child who can read and write. For example; The Burroughs Adding Machine Company analyzes its field with great intensity by listing all business concerns in a specific territory which are logical adding-machine users. Similar methods can be employed by the crane and hoist people where a definite and specific field exists for its product. Corona's market analysis, however, must include the home as well as the business house, the doctor, the lawyer, the student, the author and scores of other possible sales outlets. It is obvious, therefore, that an accurate sales analysis of such a problem is not possible. We can deal only in round numbers, and for that purpose we have tried to discover a certain standard by which our field can be estimated.

The standard that we have selected is that of intelligence, since our product is closely associated with literary and business requirements. After careful investigation of various methods of applying the standard selected, we finally adopted, as a basis for the determination of sales possibilities, the circulation of the *Saturday Evening Post*. In this connection it must be understood that Corona is sold through a dealer organization, each dealer controlling a certain specific territory in which he has exclusive sales rights. The unit of territory is the county. The Curtis Publishing Company furnishes us with data showing the circulation of the *Saturday Evening Post* in each county, and in fact in each large trading center in the country. Using these figures as a basis we then determined arbitrarily upon a constant representing the number of machines that should be sold in each territory each month in proportion to the *Saturday Evening Post* circulation in each territory. We shall say, for example, that this constant is 200, or in other words, we establish to our satisfaction from various sales records that a dealer should sell one Corona per month for every 200 of *Saturday Evening Post* circulation in his territory. This is his quota; but we have gone further with our analysis and have placed two quotas on each dealer's territory, one on the city in which his place of business is located, and one on his outlying country territory; the theory being that we have a right to expect a larger proportion of sales in the large centers in which the dealer is operating intensively, than in the rural districts where sales expense is high and the population scattered. This, briefly, is our method of determining sales quotas. The total of all dealers' quotas is our monthly budget, and it is on the basis of this budget that we in a general way plan our production. This situation would be ideal and would provide a 100 per cent tie-up between sales and production, providing each dealer could be depended upon to make his quota each month, but of course not having a 100 per cent sales department such an ideal condition does not exist. We have, however, a partial check on our sales budget through the seasonal variation in the portable typewriter business which we have established on the basis of monthly percentages of our total annual business based on sales experience. Thus we know that the period from November to June represents our sales, and naturally our production peak, and we know that the summer months can be depended upon to produce a business slump the proportions of which are fairly accurately determined.

In the foregoing I have not attempted to go into details concerning the various reasons why we selected the *Saturday Evening Post* circulation as a standard for quota, or how we selected our arbitrary constant, or how these are checked every month through monthly sales reports, or the methods by which we sold our quota basis to our dealer organization. All of these are details, but they represent months of intensive study and investigation and are typical of the complexities of any system of sales budgeting which can be depended upon to lead to even fairly accurate conclusions. The methods that I have described relate to our domestic business only, that is, our dealer organization within the United States. Similar quota methods are in use by our foreign department, but of course based on entirely different standards from magazine circulation. It might be well to say here, as illustrative of one phase of market analysis, that we do not take into account in setting quotas the excellencies or deficiencies of particular dealers; neither are our quotas based to any great extent on past performance. Each territory is made to bear its particular quota estimated on the potential sales volume in that territory without regard to the dealer who controls it. This being the case, we are therefore enabled to set up certain dealer standards, and when certain specific dealers fail to satisfy these standards it is an indication of a dealer weakness and the necessity for a change in representation. This is another illustration of the necessity of realizing that quotas or sales budgets must be based on scientific analysis of sales possibilities without regard to the human equation as represented in this instance by the dealer himself.

You will observe I have treated the subject of quotas rather more liberally than that of actual sales budgets. I have done this because any sales budgets that might be compiled must of necessity be based on quotas. The quota, as I understand it, is as accurate a representation as possible of the sales possibilities existing for any specific article in a given territory; while the sales budget represents that proportion of the total quotas which can be produced, depending largely on the efficiency of the sales department involved. It would be ridiculous to base production on the total of all sales quotas unless the sales department is so efficient that it can produce business equal to that total, and produce it in the shape of smoothly flowing streams of orders, variations in which, according to seasonal activities or other interferences, might be definitely determined in advance. I have yet to come in contact with a perfect sales department, and I am assuming that none of you has had this unusual experience, so that you will understand that the relationship between sales quotas and sales budgets depends directly on sales efficiency. Obviously, the way to secure perfect coordination between quotas and budgets is so to develop your sales department that it will come as near perfection as is humanly possible, and unless you recognize the necessity of such development and are willing to give every possible assistance to your sales department, assuming, of course, that you are willing to accept the sales possibilities as represented by quotas, this coordination will not be obtained.

I do not propose to enter into even a short discussion of production budgets. Most of you here are much better qualified to discuss that subject than I. Suffice it to say that numerous methods have been developed and approved by which production budgets can be carefully and scientifically laid out to meet certain specific conditions. In a product such as Corona, made up of nearly 700 separate parts, some of them very small, and none of them necessitating a consideration of handling problems, our production program must be well balanced in order that each department shall, as perfectly as possible, cooperate with every other to the end that the finished product may flow to the shipping department without hindrance due to unbalanced production units. This is a part of our production budget problem, the other part being that of satisfactorily meeting sales conditions. By means of our sales analysis and by checking up actual sales performances periodically against estimated possibilities, and by making certain allowances for general business conditions as well as local conditions, we are enabled to keep our production department fairly well informed as to our requirements. I must confess, however, that our present methods of coordination between sales and production leave much to be desired, and I must also make a further confession that the weakness in this coordination lies very largely with the sales department. In extenuation of our weakness in this respect I can only plead lack of sufficiently accurate sales information, but I believe that we are making progress, as undoubtedly are all of you, in the matter of the accumulation of sales and market data, so that as time goes on the coordination so necessary between sales and production will more nearly approach perfection.

You will observe that I have discussed the tie-up between sales and production only from the viewpoint of supply equalling or exceeding demand. I have done this advisedly because, at least with us, our production facilities under present conditions are amply sufficient to take care of demand, and I believe that in the majority of industries this situation is equally true. Furthermore, I believe that for several years to come production in general will be amply sufficient to take care of selling requirements, so that it will be the sales end of most businesses which is and will be in reality the determining factor.

I want to say just a word here in relation to the effect of general and local business conditions on sales analysis figures. Those of you who were fortunate enough to hear Dr. King of the Bureau of Economic Research discuss business cycles at the recent Syracuse meeting, were no doubt impressed by the immense influence which these, as yet unexplained, business phenomena have on selling. Dr. King said that he was well aware of the fact that most concerns—and a good many of them who ought to know better—had discounted to a considerable extent the necessity for taking into serious consideration the business cycle theory, but that their experience for the past few years had undoubtedly impressed upon them the value of this theory and the necessity for knowing more about it and about its effect on their particular business, and for devising ways and means to combat it. In other words, the business cycle curve can, under certain ideal conditions, be flattened to such an extent that business in general will not be subjected to such decided peaks and depressions as it has experienced during the past eight or ten years. His remedy for the situation is foresight, not only on the part of the manufacturers and producers themselves, but also on the part of their representatives—sales offices and dealers in the field. Dr. King thinks that the first indications of a decided change in the business cycle are apparent at the point of contact with the consumer. It seems obvious to me, therefore, that if we can succeed in properly educating our sales representatives in the field to the importance of these cycles and the meaning of the signals which herald these business reversals, we shall be able to exercise sufficient foresight to accomplish the very thing that Dr. King advocates, the flattening of the cycle curve so that business will neither attain the dizzy heights of prosperity nor sink to the deep sloughs of despondency with which we are all unfortunately familiar. I make this suggestion because I believe that a little thought in the matter, a little educational effort on our part and an attempt to accumulate knowledge enough to properly interpret business signals of distress, will assist all of us greatly in more nearly maintaining our sales budgets at an efficient level.

While it is true that under present conditions, and probably for some time to come, the production end of your business and mine will be obliged to wait upon the development of sales demand, there is much that production engineers can do to assist the selling executives. Among these I might mention care and thoroughness in building quality into the product, cooperation with the sales department in relation to new devices and models, a continuous and energetic effort to reduce production expense, and promptness in deliveries. This latter item, of course, refers particularly to the production of special orders made necessary by the desire of the sales department to give its customers what they want, and not insist on forcing on an exacting public designs and models not suited to its requirements. In an attempt to secure cooperation of this nature, the Corona Company sometime ago organized what we call a merchandising committee consisting of the domestic sales manager and his assistant, the foreign sales manager, the publicity manager and the sales promotion manager. Meetings of this committee are held weekly, and not only are merchandising problems considered, as well as all phases of selling and sales promotion, but also new designs, suggested changes in existing models, details of construction from a selling point of view, and matters of that nature. These latter matters are passed on in the form of recommendations to the experimental and production departments, and many of them are given consideration by the factory advisory committee which consists of practically all of the production department heads. Thus the production end of the business is enabled to grasp the sales point of view and greater cooperation naturally results. It might also be interesting to mention here that periodically sales and administrative executives are present at meetings of the factory advisory committee for the purpose of securing a more thorough and intimate knowledge of production matters, and imparting such information and data concerning sales and general business conditions as may be of interest and assistance to the production officials.

In considering this entire matter of a proper coordination and tie-up between sales and production, it seems to me from the foregoing that there is one all-important problem which must be satisfactorily solved before perfect coordination can be obtained. I refer to the necessity of the accumulation of facts and figures in relation to sales budgets that will give just as accurate and dependable information as does the great mass of data which has been accumulated with relation to production. Without a proper conception of the necessity for absolutely scientific sales analysis these facts and figures will not be forthcoming, or they will be so inaccurate as to be of no consequence whatever and possibly a positive deterrent to progress. There is a big opportunity here for him who has the capacity for studious application and proper analysis of the figures already available, because there has been compiled by numerous agencies an immense amount of information for use in the proper conduct of a market analysis.

THE MILITARY TYPE OF ORGANIZATION

A PROCEDURE FOR ENHANCING ITS VALUE

By W. Maxwell Reed[1]

THERE has been and still is a serious agitation for government ownership of large public service corporations. Some are beginning to extend this agitation to include the leading basic industries, notably that of coal. This revolt against private ownership probably owes its origin more to bad management on the part of the corporations than to the prices they may be charging for their services and commodities. If a corporation treats its employees in such a way as to cause an industrial scandal in the community, or if it monopolizes the market and then fails to meet the wants of the community either by the quantity or quality of its services or merchandise, then a serious movement is inevitably started to give the government control or possession of the offending industry. So long as prices are not unreasonably high and so long as the corporation is conducted with good will toward both its employees and the public, there is probably little chance that any public agitation for government ownership would ever be seriously considered. If a small reduction in prices were the only change that the government ownership enthusiasts could offer as an inducement to the people to support the movement, it is very unlikely that they would get many followers. But if the rank and file of the employees are suffering from oppressive conditions so that strikes are numerous and serious, and if in addition the public is not receiving either the quantity or quality or regular delivery of production that it expects, then promise of even a small reduction in prices is an important and added influence to bring about a strong public movement.

There is probably one exception to this assumed rule. It is that sometimes the well and honestly managed corporation is swept into the government vortex by a general public movement due to the scandalous behavior of its neighboring corporations. It is as difficult to guard against this danger as to protect oneself from a conflagration.

But a corporation has the power to make itself secure against government ownership so far as efficient management is concerned. It is this feature of the discussion that interests us at present.

Those who would suffer most from government ownership would be the public and the managerial officers of the corporation. The stockholders would undoubtedly receive fair compensation, and the rank and file of the employees would probably be as well off under government ownership as under private ownership. In most cases the condition of this class of employees would be materially improved. But the supervising officers would be less carefully selected, would receive smaller salaries and would be less likely to be promoted on account of merit. The public would get poorer service and in many cases would probably pay higher prices. But no matter how carefully these conditions are predicted, the people will force the government to control or purchase a large basic industry if it is managed in such a manner as to cause perpetual trouble. Obviously then it is the duty of supervising officers to do their utmost to make the organization as efficient as possible, both for their own welfare and for that of an ignorant and misguided public.

The effectiveness of their efforts will inevitably depend to a great extent upon the efficiency of the organization with which they must work.

Unfortunately, no matter how much the majority of the officers may wish to have an efficient organization, they are handicapped by being obliged to use what may be termed the military type of organization. This is a form of organization that we have inherited from the earliest times. With a few modifications it represents the best we can devise even today. As a chain is as strong only as its weakest link, so to a certain extent the military organization is seriously weakened by the presence of only one or two incompetent supervising officers.

An inefficient officer, when his department is not adequately inspected by his superiors, can injure the usefulness as well as the happiness of all those under him. His superiors would then be quite ignorant of the true condition of a whole sector of the organization chart. Of course such ignorance, or perhaps neglect, would be the fault of the offending officer's immediate superior. But it is precisely faults of this kind that are so common in large corporations. It is a source of trouble that is inherent in the simple military system that was first highly developed by the Romans. Those connected with large corporations can give many examples of isolated departments, divisions or small offices that, through an unfortunate combination of circumstances connected with their supervising officers, have remained for several years in a condition detrimental to the employees, the public and the corporation itself.

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It is the purpose of this paper to suggest a device that will automatically call attention to any weak sectors that may exist in a large organization, in order that the standard and esprit de corps of all may be elevated to a degree more nearly corresponding with that maintained by the best managed divisions.

Before undertaking to describe the difficulties of the military type of organization and to discuss the possibility of mitigating some of the obvious defects, a brief summary of the history of the industrial organization will be given so as to help the reader and the author to approach the subject with the same point of view.

The story of civilization is the history of advance in two distinct lines: One, the material side of this advance, is the record of man's increasing mastery over his physical environment; the other the gradual improvement in his methods of working with others, either through compulsory cooperation under a tribal head or ruler or through voluntary cooperation by mutual consent. The record of advance in methods of cooperation is the story of gradually improving organization. All government is organization of one form or another, whether it be the extremist despotism or the most advanced democracy.

When one considers the vast number of man's inventions and discoveries, it is surprising that he has evolved so few forms of organization—that is, few that differ in their fundamentals. It has been suggested that probably one of the earliest forms of cooperation was the hunting pack, when pre-historic man went after big game. In this and similar forms of the most primitive cooperation doubtless one man dominated—the strongest or most crafty. So long as the group engaged was small and the object to be attained simple, no organization beyond the recognition of the leadership of one individual was necessary; but as soon as the group had to be divided—for instance to head off the animal that was being pursued—a sub-leader had to be appointed and the first step in the development of organization had been taken.

From some such simple beginning the first forms of collective action doubtless sprang. As man first emerges into the dim light of remotest history we see him devoting his greatest effort to defending himself and his family group or raiding other groups. In such enterprises cooperation was essential and the organization which grew up for these purposes naturally functioned in most other group activities. As the family group enlarged into the tribe or clan the simple organization expanded, leadership was subdivided, and artificial groups, frequently of uniform size, were substituted for the natural family group; but the principle of group leaders reporting to higher leaders who in turn reported to their superiors from whom they derived their authority, was maintained. Two examples may be cited, the Roman army and the feudal system.

This form of organization, varying in detail but the same in essence in its many manifestations, may best be characterized as the military form of organization. It was largely developed under wartime conditions—the almost constant state of primitive peoples—and consists primarily in the communication and enforcement of commands originating with the superior leader through the various grades of generals, captains and lieutenants until they reach and are executed by the common soldier or worker.

As civilization advanced and non-military enterprises engaged more of the common energy, dissatisfaction with the strictly military form of organization arose, and in such communities as Greece and Rome there developed a form of organization in which leaders were selected for certain purposes by the vote of a limited number of individuals. Such an organization, in which leadership depended on the choice of even a very limited number of those to be governed or lead, contained the germs of democratic organization.

The expansion of the democratic idea was in two directions; a greater number of functions for which elected officers were chosen, and the gradual increase in the proportion of the populace who were allowed a voice in their selection. It is interesting to note that while the Romans finally gave citizenship to the inhabitants of various provinces, no method was afforded them of exercising a voice in the Roman government except by actually going to Rome. It remained for modern times to so organize a democratic government that distant communities elect and can send their representatives to the common council of the nation.

While the democratic government differs fundamentally from the military, it has taken over many of the elements and operative methods of the older forms of organization. For instance, in our own national government the chief executive and the Congress are elected, but the departments and bureaus through which the government actually functions are of the strictly military form of organization—subordinates reporting to superiors, who in turn are responsible to those higher up through a regular hierarchy of officials.

Cooperation for commercial purposes seems to be developing in the same manner as cooperation in government, but very much more slowly. For until very recently all business was done by small groups acting under the personal leadership of the owner. Only the owner received the profits and sustained the losses. Perhaps this stage corresponds with the tribal stage in the progress of government.

With the growth in size of any single business the owner had to appoint assistants who in turn, to meet the demands of still larger business, appointed other assistants. Thus a military type of organization started and developed in business as in government. So long as the manager of this military business organization was the owner of the enterprise, and so long as the enterprise involved a small number of employees, rigid inspections were made of all departments by the managing owner. The owner not only wished to avoid waste both in time and material but he wanted to make his enterprise as large and powerful as possible. This latter desire was due to pride in his job and in his own creative work. Often a few of the most important assistants were taken into partnership.

The next stage in the development came when some partners gave only capital to the enterprise but no personal attention. This was the beginning of the stock company or corporation. The development of these corporations was so rapid that in a comparatively short time, for various reasons, the control of the company came to rest with those stockholders who took no active part in the management of the company. By means of their representatives on the board of directors, they appointed the officers and determined the policy of the company. The military type of organization was used by these officers in the management of the companies. Perhaps this stage in the development of the business organization corresponds to the Roman Republic at its prime. The stockholders corresponded to the Roman citizens, the board of directors to the Roman Senate, and the salaried officers and employees to the governmental organization that controlled the provinces, collected taxes and reported to the senate through the consuls. We are impressed by the extent of the building activities of the Egyptians, Greeks and Romans. We are apt to think of their temples, roads and ships as having been built by the actual manual labor of the nationals of those countries. But of course in reality the physical work was done by slaves who had been seized in raids and conquests. The fabricating that was done in Rome, which might be considered as taking the place of our manufacturing, was largely based on slave labor which required in some cases a high order of technique and education.

A similar condition existed less than a century ago among the lower ranks of the organization in modern industrial establishments. Theoretically these employees in the organization were like Roman citizens. It was assumed they were masters of their destiny and could resign whenever they wished. Also since the men were allowed to vote for government officers it was believed they could prevent oppressive legislation. But in practice their ignorance and stupidity prevented them from using their vote to their own advantage. Their slender resources bound them to the community in which they lived. Therefore they were obliged to accept the corporation terms almost regardless of conditions. A detailed description of the condition of the laboring class in the factories during the first half of the last century would be instructive.

When the corporation reached large dimensions the stock was distributed among so large a number of investors that no one stockholder had enough stock to make it worth his while to give his time to the management of the company for the sake of his dividends only. The board of directors therefore tended to become self perpetuating. In many cases they fell under the influence of financial institutions. The bankers who were asked to endorse the credit of the company for loans naturally insisted that they should be represented upon the board of directors, and in many cases that they should control the board. This control became profitable in other ways than merely obtaining commissions on bond sales and loans. The purchases of the company were frequently used to support other corporations in which the directors were directly or indirectly interested.

As a corporation grew to very large dimensions every branch of the management became technical and required the supervision of specialists. For example, in a small company the rates charged for services or the prices of commodities can be set by the board of directors, who need for the purpose only a small amount of technical knowledge. But when the corporation has reached the size indicated by a hundred million dollars of invested capital and a hundred thousand or more employees, the determination of rates to be charged for services or commodities becomes so complicated that it can be handled only by specialists. This is particularly true if the corporation is engaged in public service and is obliged to negotiate with a government commission before setting its rates for services or for the pay of its employees. Under such circumstances the only subject on which the directors could act from personal knowledge would be finance. The management of the company is necessarily left to the officers and the corps of specialists reporting to these officers.

In the last few years a number of public service corporations have adopted the method of raising new capital by selling securities through their commercial department directly to the public. The amount sold by this method to each person is usually limited. By this means the stock tends to become even more widely scattered. Usually an effort is made to have as many of the company's customers as possible holders of the securities. The success that this method of financing a corporation has obtained indicates that at some time in the near future many public service corporations will secure all their needed capital in this manner.

When this last development has been attained we shall have a very interesting situation. The stockholders meeting will long since have become a mere legal ceremony. A sufficient number of proxies is always sent in by the stockholders each year to give the administration the overwhelming control of the meeting. The administration nominates and elects its candidates for the board of directors. Except for the occasional change in by-laws little else is done at one of these meetings where a mere handful of stockholders is in attendance.

With the increasing complexity of the business and the increasing ability and skill of the departments of all kinds, including finance, commercial and personnel, the directors will find that they are left only the job of electing officers (whose names in most cases have been suggested by officers actually managing the company's affairs) and filling vacancies on their own board. When this stage is reached the board of directors is likely to fall into the same class of legal nonentities that the stockholders have become.

In some large corporations the tendency is to select as directors men of influence in their community. Such men have been considered valuable in helping to prevent undesirable legislation and a hostile attitude from the public. Naturally such men are likely to be wholly incompetent to assist in the actual management of the company. But public relations is also becoming a technical subject which can be handled intelligently only by specialists. To rely upon the influence of a prominent coal dealer, lawyer, banker or mill owner is becoming obsolete.

What then are the characteristics that a member of the board of directors should have? If a director of a large and well-managed railroad were familiar only with the various branches of the retail business, his managerial advice would be of little value to the railroad. On the other hand, if he were thoroughly familiar with one or more of the large departments of the railroad and a recognized authority on the subjects involved, his managerial advice would have considerable value. This does not mean that the board should be limited to those who are specialists in such matters as maintenance of way, railroad accounting, design of rolling stock and assignment of rates. For in the imaginary company we are considering there would be the need on the board of directors of men who have given the major part of their time to the study of economics, banking, finance and personnel relations. We therefore come to the conclusion that a board of directors should have such a membership that at least one member can always be found who can speak with authority on any one of the great primary elements that are involved in managing the corporation. In a large corporation, if well managed, the heads of departments represent just such an assortment of talent and experience. The Dennison Manufacturing Company's solution of this problem is to elect only members of its organization to the board of directors. In this case the members of the board are managers of the company. They can speak by virtue of personal knowledge concerning all phases of the business and can act upon their own initiative concerning the policies of the company. Perhaps we have here in the Dennison plan a stage in the evolution which ultimately will require that the board of directors shall consist only of the heads of the important departments. The members of the board would then themselves execute their decisions.

How the board of directors will be elected in the future and what will occupy their attention is interesting, but is only indirectly concerned with the subject of the present discussion. For it is clear that as the board of directors either becomes nominal or becomes a part of the organization, that the last vestige of a rigid inspection from an outside source will have passed away. The organization consisting of the supervising officers will be left alone to carry on the business. Their own personal welfare and patriotic loyalty to their profession will be the only motives that will make them work for the progress and improvement of the business.

It is therefore important that every safeguard should be used to make the organization as efficient as possible. Also such efforts should be made while the board of directors and stockholders are still in close touch with the supervision of the corporation, in order that the modified type of organization may have time to become well developed before it is required to take the burden heretofore taken by the stockholders. Naturally such safeguards are of little value when a corporation is small and well supervised. But as it grows larger and the supervision for various reasons becomes more lax, then devices intended to supplement the care superior officers take of their subordinates are of increasing value. Obviously they will reach their maximum value when inspection from outside sources will have ceased to operate.

We have seen that a corporation is like a huge system of railroads converging upon a single terminal. If a superintendent of a division fails to give proper supervision, then that part of the track will be handicapped and may be below standard in efficiency. All subsidiary tracks that converge toward the tracks on this division will also be more or less obstructed. Yet the system as a whole may be operating fairly smoothly. Years may elapse before the troubles that hamper trains in passing over this particular division are discovered and removed. But a modern railroad system has also a series of block signals. When something is wrong on a section of a track one of these signals becomes red. It does not indicate the exact nature of the trouble, which may be a broken rail, a washout or a train on the track. It merely indicates that if you want to use the track to its fullest capacity you must give it a careful inspection. We therefore want some similar device in our organization so that a danger signal calling for inspection will be given when a captain fails in his duties toward his company and when at the same time the major fails to investigate conditions in his battalion.

The large corporations have then apparently the serious difficulties to overcome in the near future. One is the proper selection of members for the board of directors and the other is overcoming the weaknesses inherent in a military type of organization.

Let us consider the latter difficulty. We shall use military titles, because every one knows the army sequence of authority. In industries titles are used with very different meanings. Sometimes a superintendent reports to a manager and sometimes a manager will report to a superintendent. So to avoid misunderstandings we shall assume that industrial corporations are using military titles. We shall then be sure that we are describing a sequence of authority that will be familiar to everybody.

Just as a chain is as strong only as its weakest link, so in some respects the military organization of a corporation is as strong only as its weakest supervising officer. In theory the colonel supervises the majors who in turn supervise the captains. That is, the superintendent supervises the assistant superintendent who in turn supervises the foremen. Or the general sales manager supervises the district sales managers who in turn supervise the local sales managers. But in practice this supervision is very frequently superficial. The major takes the captain's word for the condition and activities of his company. In industrial language the superintendent trusts the reports of his assistant superintendents concerning the condition and activities of the various departments presided over by the foremen. If he makes an investigation it is more or less like a dress parade. The information he gets is perfunctory and may be misleading. If he talks with a foreman he hears only what the foreman thinks the assistant superintendent would like to have said. The activity of the department is often judged by its cost records. The more satisfactory these records are in the opinion of the superintendent, the less attention the department gets. In most cases in factories in the United States there are no cost records that are reliable. Under such circumstances so long as a department works in harmony with those that precede and follow it in the sequence of operations, it is often ignored by its supervising officer. Sometimes a group of employees are ignored for other reasons. The colonel is overburdened with work given him by the general and trusts that his majors are keeping in close touch with the work of the companies. But a major may himself be overburdened with work given him by the colonel or assigned to him according to the routine of the organization, or he may be lazy and careless. In such cases he will accept the word of the captains that all is well with their companies. In industrial language of course the captain becomes a foreman and the major an assistant superintendent and the colonel a superintendent. Perhaps the company or the foreman's department is getting along all right, but frequently it is not. A very bad situation can exist for years without being remedied or even known to the colonel or superintendent. So long as the situation is not so bad as to disturb the business seriously it frequently is ignored for years. Every one at all familiar with a large corporation can give many examples of groups of employees that are badly supervised and therefore acting in a manner detrimental both to the corporation and to the public whom the corporation may serve.

When the corporation was small and was managed by its owner, the various subdivisions were usually scrupulously supervised by the owner. He knew the situation in each foreman's department or in each district sales division. Oftentimes a group of employees were badly treated because of the natural "cussedness" of the owner; but when the companies were small they were never overlooked, for the owner always knew of each small division in the organization although he may have neglected them.

With the large corporation failure in supervision becomes a very serious problem. Not only is it sometimes caused by carelessness, laziness and deliberate neglect of duty as already indicated, but it can also be caused by the overburdening of the supervising officer with work that he does himself instead of delegating it to his subordinates. Under these circumstances the industrial colonel is often so confined to his private office that he merely accepts the reports of his majors in regard to the condition of subdivisions reporting to his captains. The supervising officer seems to fail to realize in many cases that the officer's main duty is to supervise his department or division. Work that he does himself without reference to his subordinates should occupy a minor portion of his time. Perhaps this desire of supervising officers to be doing some definite work as much of the time as possible, is an inheritance from the country's pioneer days, when business was transacted on a small scale and a certain part of the routine work was very properly done by the manager. Possibly he did the buying and paid the bills in addition to supervising the employees. Even when the corporations have become very large this habit of work on definite objects still persists with the supervising officer. I once knew a factory manager who spent nearly all his time at his desk attending to correspondence, much of which was of minor importance, and in keeping certain records which should have been taken care of by others. One day he had been obliged to spend all his time in settling questions of policy for the factory and in changing the character of his products in consultation with his salesmen and foremen. At the close of the day he remarked: "I haven't had time today to do any real work"! He failed to realize that what he had been doing was his real and most important work. In factory organizations we have all seen heads of departments working overtime year after year while their subordinates had not enough to do to keep themselves busy during the regular hours. Perhaps this attitude is due in part to our pioneer inheritance and in part to the opinion of the supervising officer that his subordinates are not capable of doing the work that he is doing. The result of course is the neglect of his primary job of supervising a department and developing an efficient personnel. But it is not always the major's fault that he spends an unduly large amount of his time at his desk; he is frequently obeying the orders of his industrial colonel who in his turn is overloaded by work given him for his personal attention by his industrial general. From a sense of false economy the general has assigned too much to the colonel's personal effort. I know of a large mill that suffered from insufficient supervision. But the owner could not bear to see anyone who was not working on some definite desk job. As a result of this mistaken economy hundreds of thousands of dollars a year were lost that might have been added to the net profits of the corporation. On the other hand I remember an Englishman once telling me that when he inherited the control of a mill he decided that there should be one man who could walk through that plant with his hands in his pockets, and he was going to be that one. If his mill were a large one, perhaps he would have been still better off if there had been more than one who could supervise in this manner.

During the last century the armies of the leading nations have introduced two modifications in form of organization. One is the so-called "general staff," and the other is the "functional type of organization." These innovations have both been adopted in recent years by the more progressive corporations. While these features may tend to alleviate the bad conditions that we are describing, they can by no means be considered as remedies.

The principal of the general staff has been adopted by many corporations without the name. The staff was designed to relieve the administrative offices of many duties that the ever increasing complexity of business has imposed upon them, and to insure that these duties shall be more intelligently and carefully performed. But unfortunately few executives use their staff for all the purposes for which the "general staff" was originally created. In most cases it is used only for research work. Outside of the army it is seldom used to relieve the officer of detailed executive duties.

The other innovation called "functional management" that has been introduced into the military type of organization is subject to the same defects that we have been describing. For in functional management all those engaged in the same line of work or profession report in the usual sequence to some general officer, who in turn reports to the general manager or the president. In certain types of business as well as in military affairs this form of management has many advantages. But it merely breaks a corporation up into several parallel streams of "hierarchy of authority" instead of one broad stream. Each sequence of authority or department as it is called in industry represents the simple military type of organization and therefore is subject to the defects that have already been described.

To overcome at least in part these defects in the supervision and the resulting inefficiency of the military type of organization, the following modification of the supervisory feature of the organization is suggested.

Let each rank among the supervising officers have the opportunity to comment upon the character of the management to which they are subjected and to make suggestions concerning the improvement of the activities in which they are engaged. This does not mean that each rank would take an active part in the management. It merely is intended to give each rank or group of supervising officers some official means of commenting upon that part of the business in which they are most interested. It is an official publicity device, where the criticisms and suggestions are composed by one group of supervising officers and read only by their superiors.

It is obviously unwise for a subordinate to criticize his immediate superior. Unless he succeeds in having his superior removed from his position, the employee is almost sure to suffer in regard to promotion or to preferment of one kind or another. Therefore any criticism made concerning the management of the corporation must be as far as possible in general terms. Personalities should be avoided unles a condition is very flagrant.

It is not contemplated that this device should extend to the rank and file of the employees. Unions and employee representatives are the means whereby the lower ranks of the employees give advice and can ask for the remedy of grievances. It is intended that this device should eliminate failures in the supervisory methods.

In order to work out the details of this plan let us take for an example a corporation whose officers are scattered over a considerable territory. An assembly of officers of a given rank will then have to be confined to those from a comparatively small territory. The lowest rank to be involved in this plan might be the managers of the local offices. Our assembly would be composed of all managers of local officers who report through various district managers to the same division manager. These local managers could correspond to lieutenants in our standard scale of authority. The managers' immediate superiors, who perhaps would be called district managers (in our industrial language) would then correspond to the rank of captain. Thus in army language the lieutenants of a battalion would meet in an assembly for the purpose of discussing impersonally the character of the supervision and the management of the battalion or division of the corporation to which they belonged.

In order to keep the assembly from dwelling upon trivial details or petty grievances the following procedure is suggested:

As soon as the assembly meets it will organize by electing a chairman, a secretary and a committee on resolutions. The major or division manager will then submit a few subjects in writing on which he would like to have the comments of the assembly. The various captains or district managers will do the same. The assembly itself will originate subjects on which it would like to express an opinion. All these subjects will be referred to the committee on resolutions. The committee will formulate such resolutions as it thinks proper and refer them to the assembly for approval, rejection or modification. Such resolutions as are passed by the assembly will be sent to the major or division manager and the captains or district managers.

The next assembly to meet would consist of captains or district managers. Since there are only a few officers of this rank in any battalion or division of the corporation, the district managers of several divisions might unite to form one assembly. They would then organize in the same manner as the lieutenants had done, and would receive subjects for discussion from their majors or division managers and from their colonel or superintendent. Of course they would also originate subjects on which they might wish to express their views.

In this manner each rank in turn would have an opportunity of meeting and expressing its views upon the subjects that most concern it.

The first effect of this series of assemblies would be to eliminate the bad management in various isolated districts. Employees are almost always keenly interested in good management; given an opportunity to express their ideas concerning their environment they become especially so. The resolutions of these small assemblies would be the block signals that would indicate that something is wrong in the territory over which the members of the assembly preside. It would indicate to the higher ranks that an investigation should be made concerning certain subjects. Naturally definite information concerning the personnel involved and the exact location of the trouble would be omitted in many cases. But where general topics were involved a more definite type of resolutions might be made.

These assemblies of officers would give an opportunity for the expression of views that otherwise would never extend beyond a limited environment. The mere formulating of opinions, which by the nature of the organization would be bound to be heard, would tend to arouse a greater interest in the organization and business on the part of the subordinate officers. Those who had initiated and supported a resolution concerning some feature of the business in which they were interested, would become the ardent supporters of such a policy. There is a tendency in large corporations to let the general staff do most of the thinking. The main purpose of the device that has been suggested is to induce thinking on the part of the lower ranks of supervising officers and to afford a channel by which their suggestions and criticisms may effectively reach the higher grades of supervising officers. The experience of a few progressive corporations has indicated the large amount of interest in the business that can be aroused when those who are closest to the work are given an opportunity to take part in making improvements and eliminating bad conditions.

In the primitive organization the foreman attends to everything in his room that comes within the limits of his authority. If a question comes up that is unusual or important, the foreman refers it to the assistant superintendent who may give the final answer or in his turn refer the question to the superintendent. The "buck" can be passed only upwards until it reaches the owner where it is settled either wisely or unwisely as the case may be. During the question's journey upwards no officer can say "the answer to this question does not concern me." He can merely say, if he is going to pass the buck to his superior, that he considers the answer of the question to be of too serious a nature for him to take the responsibility of formulating it. Therefore the resolution of an assembly of officers would very much concern their superior officers, who in this simple organization have wide scope in authority and consequently diversified responsibilities. All officers then for several ranks in direct line from any given assembly would read attentively the assembly's resolutions. They would realize that the resolution referred to their job as commanding officers and that ultimately they could be held responsible by their superiors or their board of directors for their actions concerning these resolutions or their failure to act.

The same situation would be true for those corporations that had the functional form of management. But when a corporation has a general staff and perhaps staff officers for several subordinate officers, it is not so clear to whom a given question shall be referred. Undoubtedly many of the subjects touched upon by the resolutions could best be handled by some staff officer. At least it would be the duty of some staff to make the preliminary investigation, while the ultimate decision might rest with some line officer. Of course, this staff organization is the more efficient method of management whether the corporation be large or small and even if the staff consists only of half the time of a single officer.

Where staffs exist it should be part of their duties to read the resolutions of all assemblies that come within their sphere of activity. They would be held responsible for failure to take the necessary steps to start such an investigation as some resolution might indicate was desirable.

The policy here suggested is more than a mere mechanical device to point out spots of bad management. It is in line with the modern method of inducing employees to do their best. In the early stages of corporation development large profits were made by exploiting natural resources. In the next stage of development the wealth of the country was increased by the use of improved methods of manufacturing. We are apparently about to enter upon the third stage in the effort to acquire wealth; namely by means of improved methods of handling employees.

Let is be stated again that the main purpose of the plan suggested in the preceding pages is to foster creative thinking. John R. Commons has well expressed this idea.

"Isn't it something like this? Thinking and planning for the future. Keeping the mind of every man away from whatever there is of dullness and monotony in his task. Just touching the imagination; arousing in every heart zeal for progress and pride in a great common enterprise; lighting up the most menial and stupefying task with the rays of a great industrial vision."

We now see that management is becoming more and more the primary force for leadership in our large corporations. The time is apparently not far off when management will be the undisputed leader, with the stockholders and the rank and file of the employees subservient to it. We should therefore make every effort to make this management as efficient as possible in order that it may be able to occupy the place that it is destined to hold.

To quote from Common's "Industrial Government": "The outstanding fact of our investigation is the importance of management. Instead of capitalism moving on like a blind force of nature, as Marx thought, here we see it moving on by the will of Management. It is Management that attracts capital through the confidence of investors, for the bulk of investors, like the bulk of laborers, do not want and cannot manage industry."

If the organization that is responsible for a large public service corporation is not satisfactory, the government will take over the corporation. When such a time comes it will be useless to point out that the management will then be worse. Public pressure will blindly compel the government to absorb the additional activity. If such a step should be taken the rate of pay of the supervising officers would probably be materially reduced. Promotion would depend to a less degree upon merit. Therefore it is important from a personal point of view that that part of the organization that consists of supervising officers should be managed as efficiently as possible.

INTO every branch of industry the human factor enters and where that factor exists, there must always remain a field outside the province of science. No amount of scientifically determined facts and principles can materially affect the problem of labor, except by indirect means. Science may elaborate, for instance, principles for the planning of work which are capable of universal application, but it must inevitably make the reservation that such principles are subject to the vagaries of the human factor. In other words, in so far as management deals with things, its methods can be reduced to terms of scientific principles; but in so far as it deals with men and women, it can only use scientific principles to the extent that the men and women are willing to subject themselves to them. The science of management may arrive at definite conclusions for each element of a man's work, but it is the art of the manager alone which will induce the man to put those conclusions into practice. There may be a science of costing, of planning, of manufacturing, and of dispatching, but there can be no science of cooperation.

This reservation is important, for there is a tendency, in the modern cult of efficiency, to imagine that, given a basis of scientific principles, the art of the manager consists only in applying those principles. This is far wide of experience. Where human beings are concerned, scientific principles may be so much waste paper. Certainly there are scientific ways of engaging and discharging, of paying, and of stimulating employees. But we have to recognize that such scientific methods are as likely to fail as to succeed, unless there is more in the manager than the knowledge of a set of working principles which he tries to twist around to meet the situation. A science of management can only affect the circumstances surrounding the relations of management and workers; it cannot touch the immediate human relations. That must remain a problem of mentality, of spirit, of ideals. The accumulated experience of the whole world would not ensure the wise application of one single principle to the relations of one man with another. The development of management as an industrial art, therefore, must come, not only by the construction of scientific principles governing the methods by which management may achieve certain ends, but also by the growth of a spirit in industry, governing the relations between all the various grades engaged in the conduct of industry. (Sheldon, *The Philosophy of Management,* pp. 34 and 35.)

PURCHASING AGENT AND ENGINEER[1]

By W. E. Irish[2]

ONE time some one made this statement: "There is nothing so good that it cannot be improved upon." Probably at the time it was made as the expression of an opinion; since then, as almost every one will agree, it has been proved to be true, and therefore it has graduated from the opinion class and has become an accepted fact.

In most well-organized manufacturing concerns the relations between the purchasing agent and the engineer leave little to be desired; in some they are not so good, and in a few they are very strained indeed.

However, applying the statement which was made so long ago and that is now known to be a fact, it can be seen that there is room for improvement in these relations. In those well-organized companies much might be gained even if little is desired, were the situation studied carefully; and certainly, could the lines of action as used in these same companies be applied to the less fortunate ones, the latter could at least enjoy a greater degree of freedom from unnecessary friction and an increased productiveness.

It is the purpose of this article to assist that manufacturer, if possible, who can see the possibilities in bettering the relationship between his purchasing agent and his engineer, by putting down the facts obtained by inquiry and experience that govern the situation. These facts fall into two classes that tend in opposite directions and either hinder or assist, and it is patent that the elimination of the one and the strengthening of the other will give the desired results.

Some may be of the opinion, and naturally so, that the author is an engineer and therefore biased in his judgment. His tendencies will all be in favor of his side and may put the purchasing agent in an unfair position. His statements will therefore be of no value and his decisions will carry no weight. One is entirely justified in taking this stand until he reconsiders the stated purpose of the article, to put down facts. An opinion is a belief which may be held by any one and often tends to be acutely partisan. It is something, moreover, which has not been proven and therefore will not necessarily stand against opposition. A fact, on the other hand, is that which has been proven to the satisfaction of every one interested. It will stand against any opposition, is not partisan, and is only not recognized by those who are unfamiliar with all the conditions which it governs.

It is conceded that no blame can be attached to any man who does not recognize a fact as such, for were he able to make himself familiar with all that goes to create any very wide range of conditions, he would necessarily be talented far in excess of the average.

It often happens, therefore, that facts must be proven over again to each individual who sees them for the first time. With this in view, a sufficient number of fair statements can be made in support of the listed facts, so the latter will be recognized as such and the article can be accepted as non-partisan and used to advantage.

Departmental management of the average manufacturing concern can be roughly divided into two headings as viewed by the manager in his line-up to keep things going as they should and to establish and maintain the prestige he desires in his field. These classes may be called, that which deals with the outside and that which is essentially internal. He will consider sales and the credit and collection division of the accounting department as being the main factor in the first class, and production, inspection, cost-keeping, purchasing and engineering in the second.

Appreciating the fact that certain of these departments in the latter class, particularly purchasing and engineering, also deal with the outside world as a part of their duties, he will keep them in the back of his mind as subjects for investigation from time to time to see that they are functioning in this regard as they should. The very fact that for the most part these two departments answer directly to production in the average plant, shows, however, that he considers the status of their outside contacts as more or less of minor importance, and that the manner in which they meet the requirements of production cheaply and economically is not of so much weight as the danger of failing to secure supplies and equipment by any means at all.

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[1] Paper delivered at a meeting of the Central New York Section of the Taylor Society, Syracuse, Feb. 21, 1923.

[2] Chief Engineer, Hydraulic Pressed Steel Co., Cleveland.

It can be shown that this attitude on the part of any manager is a dangerous one, for the purchasing agent can do as much good or harm, depending on the impression he creates with the salesmen from other companies doing business through him, as can the company salesman himself on whose shoulders rests directly the burden of keeping the prestige of his firm at a high point.

It is true that the impression conveyed outside by the attitude of the purchasing agent and the manner in which he manages his department reacts on the standing of his company indirectly. Nevertheless, it does react, and often in a startling fashion, as the manager would see at once if he were to investigate with this point in view.

Granting such an investigation, there is little doubt that the status of the purchasing agent's outside contacts would be put at least on a level with the importance of his getting materials in his receiving door on time and economically.

Suppose a condition that could arise very easily, and no doubt does every once in a while, and see how it works out.

A certain company is supplying fabricated parts that enter into their customer's complete assembly. This customer is also buying parts made from the same material from one of the company's competitors, and in addition, uses a large amount of the raw material itself. Assume that this customer through their engineering organization have placed a rigid specification.

The salesmen from the various raw material supply firms call at the request of the three company purchasing agents, the two competitors and the customer, to submit their prices and to discuss the specifications. Quite naturally the customer agent will insist on close adherence to these specifications, and it so happens that one of the agents for the competitors also stands his ground fairly and firmly. The other, however, either through lack of knowledge of the importance of the specified limits or through failure to consult his own engineering staff or even with the consent of his engineers, allows certain conditions to slide for a price concession.

It might easily happen that one raw material supply house secured all three orders, being at the time in good position to deliver, except that they were short a small amount of the rigid specification material. They, however, had some other that was fairly close, and consulting their orders they saw that one of the customers was not particular. All three orders were therefore filled. In making shipment this off material was sent by mistake to the customer company and to the not particular agent's firm, and in due course shipments of fabricated parts reached the customer's platform.

Their inspection department checked representative units and found them satisfactory, so all was accepted. When, however, the customer company came to receive their own raw material which had been specified for a later date than the other two, they found it "off" and rejected it. The supply house at once sent the salesman who had made the deal up to the customer's purchasing agent to investigate. In the course of the talk, which became rather heated, as such talks are apt to become, the salesman made the remark that he could not think of a company that rejected material of a certain kind sent them direct and then let the same thing exactly come from other sources without rejection. He knew from inquiries he had made that they had taken in the fabricated parts from what he assumed had been used by one of the two companies to which he had sold the substitute material. The purchasing agent asked that this be repeated before the engineers and called them in. The salesman knew that he had made a slip, but could only do as requested.

A check was made of all the raw material while the salesman stayed over, and the portion shipped in error was soon discovered. The salesman could do nothing but take it back, and the company whose purchasing agent disregarded specifications and showed himself to be loose in his company stand to the outside sources of supply, received back all it had shipped, and were off the list of the customer company, regardless of all that company's salesman could ever do.

Such things are happening every day, perhaps not so drastically, perhaps not so far-reaching, but every little incident that the salesman carries away with him after his audience, or his inability to get an audience with the purchasing agent, travels with him to all the other companies he sees. These other companies are in many instances customers of that agent's firm, and it does not take long for them to size up their chances of getting the things they asked for, as they ask for them, in proportion to their knowledge of the agent's tactics and methods, gained very largely from remarks let drop by the traveling supply and material salesmen.

It would be possible to relate many other instances and examples of the results of good and bad contact on the part of the purchasing agent and their far-reaching results. It is probably necessary, however, to prove the point a fact by using the preceding supposition only, for it should not fail to draw to the memory of most anyone in contact with the ins and outs of the manufacturing game, personal experiences that will parallel it in actual happening.

It is therefore a fact that the impression made on the outside world by the purchasing agent is indirectly as far-reaching in its effect on company's welfare as that created and maintained by the salesman directly; and further, that this impression is as important a subject for control on the part of the manager as is his desire to buy to good prices and timely deliveries. There was a time, and that not so very long ago, when the conditions that governed the daily running of a purchasing department were far different from what they are today. Events followed each other in a more sedate fashion. There was not the multitude of different makes and qualities of the same material on the market. One source for a given thing could be decided on and then stayed with. The purchase time requirements were in favor of the agent and allowed him to deliberately investigate all the conditions. Firms produced their work so that from year to year it did not vary from one or possibly two uniform qualities. No great changes in practice were necessary in the shop.

Machinery and all the changes it has forced by way of competition in production was not a governing factor. Tools were by the same token limited in their scope and range. The manufacturer who had the best craftsmen had an established business and a set round of customers. The purchasing agent had time to keep his records up to date and to talk to the comparatively few salesmen who came around in the week to see how things were going, and to pass the time of day. There was one accepted steel and one best lathe which he could buy and one wagon to deliver his goods to the railroad station.

And then one day he found that there was another steel company that promised to do better for him than the old one, and another company started production of machine tools in competition with the original mill. A man showed up who had better tool bits to use in the lathe rest, which could take a deeper cut, and three or four outfits could replace the old style methods in the different departments. There was a chap who could sell belting that was not made of leather, and a special machinery builder would cut the run of the operation in half; and so it gradually grew with ever-increasing speed until there came the day that the agent found he was literally swamped. Certain of the machines he had bought broke down from lack of correct design; several of the new sources of material failed of timely delivery; his own concern had taken on some side lines which necessitated his finding and securing a number of items of material he had never heard of before. He was given assistants and still had to work at night; and while he hated, as any man who was proud of his job would, to acknowledge defeat, he was forced to the conclusion that things had come to such a pass as to make it physically and mentally impossible to do justice to his job unless he could become superhuman and master a half dozen professions besides that of buying overnight.

Knowing these things and realizing the impossibility of knowing for himself all of the things that had to be known to keep things going to the best advantage for his company, he cast about for ways and means to relieve the situation. He started by analyzing the standing conditions. He set down the things he had to know to hold down his own work as it had been, items in his profession that had always been his and that should rightfully stay under his direct control from the very nature of his training. These things listed somewhat as follows:

All initial contact with outside salesmen.

The actual contracting for anything and everything that was to be bought.

The price-setting based on adequate information.

The terms of delivery and payment.

The search for and location of adequate numbers of reputable companies for any given material need.

The final control of the purchasing department contact policies with incoming salesmen.

He studied these items and then listed those things which he had not named and that it would be impossible for him to cover in person for reasons that were apparent and not capable of alteration. He realized that they were of equal importance to his success and saw that he could name a very long list, but he took care to put down only the ones that would be necessary to the start of any change in previous practice. They were as follows:

Intelligent interview with salesman who represented highly specialized or technical lines, where his lack of training on mechanical lines kept him from being able to accurately judge their value even after he had satisfied himself as to the standing and reputation of that salesman's company.

Means and ability to conduct and follow the results of tests in order to do justice to the salesman submitting the trial material and to know without the chance of error the true merit of that material in its relation to possible savings to his company.

A definite knowledge of the time service of a given material and the recording of information as to the causes for the final failure, in order to be able to determine whether the grade and attendant price of that material was being maintained too high or too low.

Means to check the actual use by the plant of materials purchased for a specific purpose, and a guard on the definite way that material should be used in order that the company might get the benefit of the possible savings for which he has spent their money, instead of putting their dollars on some stock shelf to waste away in idleness.

Specialized consultation of subjects out of his range and specialized assistance to secure for his company the latest and best both by way of materials and service, things he could not find himself because he had no way of knowing where to look or what to look for.

He studied this list for a considerable time and knew that if he could find the way to fulfill these conditions and work them to stay in harmony with his first list that he would once more not only have his department working at top efficiency, but would be able to keep it there.

He appreciated that it would be necessary to solve this problem by obtaining assistance from one or the other of the plant departments outside of his own, and whoever he should pick would have to be able to meet all points that were beyond his direct capacity.

First, this assistance must come provided with the necessary technical knowledge.

Second, there must be involved no chance of any element entering in that would judge trials of materials on other than actual service rendered as against the dollar spent.

Third, whoever was to give conclusively the right answers must not be tied down to or influenced by local conditions in any given part of the plant, but must have the free swing of the entire layout from receiving to shipping.

Fourth, there must be included the power of supervision over the actual application of any material bought for a specific purpose, to guard against its incorrect use or its failure to be employed at all.

Consideration of the subject pointed to one department as being in possession of ability and capacity to meet the requirements to the best advantage. The engineer through his technical training is able to cope advantageously with mechanical and technical questions, if not directly, then through reliable sources of information he has located and holds in readiness.

He is interested in any material only on the basis of the use he can receive from it, for his very existence depends on that service.

He is responsible for production indirectly and as a whole, and is not tied down or influenced by conditions in one department that could not be applied to any of the others.

He is held responsible for the amount of money charged against him in a month as against the percentage it shows of the production dollar, and is therefore careful not to put more into any one project than it can economically bear.

Due to the fact that he is more or less of a free lance in the entire plant, appearing wherever there is trouble, he is fitted to see operations as a whole, and he is invested in most plants with the power of control in the use of materials and equipment.

In short, the engineer is the logical man to work hand in hand with the purchasing agent, and it is possible to a very large extent to measure the success of either one of the two departments in direct relation to the degree of this closeness.

Many firms and most purchasing agents have realized this point for some time, but there are some few who have not found it out and are laboring hard as a result. There are even some of both purchasing agents and engineers who refuse to appreciate the value of each to the other, for one reason or another, and wonder why it is that their standing with the outside world is so low or that they are rated as so relatively unimportant when it comes to decisions on company policy.

It is generally conceded to be true that half the battle to gain a point has been attained when any individual or group has arrived at a knowledge of the governing facts to the elimination of ungrounded opinions, and have so regulated them that there only remains the following of a definite, laid-out policy. These facts are often hard to see from the very reason that they are such every-day happenings that they are more or less accepted as being part of things and not subject to change.

Here is the point where the efficiency man comes in, and is the reason why he can usually demand such large returns for his efforts. Being an outsider he is not influenced or controlled by any conditions that existed previously to his arrival, and is therefore easily able to see flaws and recommend their correction. Hardly ever is there a firm through which he has gone but that can say after the bill has been paid that he has told them nothing that they did not already know.

This article is made to operate in very much the same way, pointing out results which will help toward a more close alliance between the purchasing agent and his right hand man, the engineer. Practically anyone can put this indicated procedure to work for himself and prosper in proportion. Then when through, they can say with all fairness that there has been nothing they had not thought of many times, but had somehow never got to working out before. There is probably no greater chance for mix-up and crossing of purposes and failure of accomplishment of a desired point on the part of the two departments than exists in the lack of a definite understanding and agreement between them of the limits in their responsibilities toward each other.

The agent has referred a salesman to the engineer for interview only, without any idea of making a purchase until he has had time to digest the information he will desire from the latter. The engineer sees the advantages of the article submitted and they strike him so favorably that he promises an order. Whether the purchase is finally made or not, he has gone entirely out of his jurisdiction and has placed himself and the agent in a very awkward position. The salesman begins to wonder what the purchasing agent is for in the organization, and his tendencies will be in the future to ignore him altogether. If the purchase fails of approval, his ideas on the authority of either agent or engineer are rather low, to say the least.

It is the chance of this thing happening that makes the agent who is proud of his position, as he should be, very chary in letting the engineer come in contact with any of his callers. There can be no blame attached to any agent who has this feeling, as the fault lies entirely with the firm whose rules allow any one at all but the agent to start the contract, or who fails to let the salesman know definitely that the purchasing agent only places the order, and that this is the line of action he must follow to obtain any business.

That is the agent's side, but suppose as often happens, that the engineer has found through careful experiment that a certain material is far and away the best for all purposes to which it will be put, regardless of the fact that its cost is higher. Suppose he requisitions this material and the agent side-tracks it for a cheap substitute, disregarding the engineer's recommendations. Then he has gone beyond his jurisdiction and has put his unsupported opinion against the engineer's facts based on actual test. The reputations of both will suffer with the outside, and the engineer will be prone to minimize the importance of requests for test runs or trial supervision if they come from the agent.

Again, neither is very much to blame for the condition. They are neglecting their useful services to the company while they consider the unfairness of things and hold hard thoughts for each other, while all the time the real cause of the situation can be attributed to the failure of the management to lay down the necessary rules of order. A definite understanding between departments is therefore the very first thing to establish if the action is to be smooth and profitable.

Time limit in making purchases is a factor that affects the proper operation of the agent-engineer combination. The agent will get a requisition for a certain article and will call in several representative firms. He will then have them submit their samples to the engineer for test, and will get the results and the name of the best firm to deal with, only to find that the article in question has to be obtained a lot sooner than this particular firm can supply it. Both agent and engineer are disappointed, and while the agent wonders why the engineer could not have said one of the quick delivery brands was all right, the engineer feels sorry for the lack of back-bone in the agent in not forcing timely requisition on the part of the shop.

Oftentimes this article is for the engineering department itself and it is clearly the duty of that department to bend every effort toward the elimination of the condition. Sometimes the agent is so busy thinking that the particular brand is difficult to secure, that he will let it lie and assume that timely deliveries are impossible, without even trying to make the grade.

When this occurs there are sure to be sparks and strained relations, for one of the creeds on which the engineering department has to operate, calls for the elimination of the word "impossible." Management does not allow them its use when it comes to getting things going in the shop, and being human, they do not consider that the agent should have the privilege either.

This condition often results in the engineer taking the bit in his teeth and actually finding out, as the agent could have done, that by a little extra effort the impossible was not so hard after all.

The agent has no way of getting away from his desk for any length of time in order that he go thru the plant and get the feel of things he has purchased, or to become sufficiently well acquainted with conditions, past or present, to be able to guide himself in determining future possibilities. The engineer, however, is in just the right position to supply him with this lack and can, if he works in close cooperation, be of very great assistance.

He can, for example, see a new operation started or from his experience will know of a change in methods which would effect big savings. He has only to make this fact known to the agent and he is then in exactly the right position to secure representatives from the outside who can talk things over and offer the thing that will be needed.

Again, the agent may purchase a standard article on which there is very little range in merit between several makes. He knows that he has the right thing, or at least, the best obtainable in the limits of his and his engineer's knowledge. This article is put into service and as far as the agent is concerned, forgotten. It has to be so in the very nature of things, for he has many other duties crowding him. The engineer, on the other hand, watches the performance of this article from day to day and it enters his mind that he is not getting all that should be gotten for the price. He asks the agent for the representative to talk things over, and sure enough, he has found a chance of making a saving due to a very small point indeed, a point the agent had no way of knowing.

An actual experience with saw blades furnishes an excellent example of this point. Most people with the exception of the men who sell a given brand, will assume that a saw blade is a—merely a saw blade—granting that the temper is uniform and right, and that the steel is average. In this particular case, a machine was running all day cutting nickle steel tubes. Many different grades of teeth had been tried and the best results that were obtainable even by adjusting the weight and doing everything that could be thought of, consisted of two tubes to one saw.

This is the point that did not sit well with the engineer even though he could see no solution, after trying different methods and sizes, purposes and speeds. The representative was called, through the purchasing department, and looked things over. He said that he could do much better and produced a saw from his bag that had the same tooth pitch as the ones that were being used. But there was a certain difference in that the one he put in the machine to try out had no set on the teeth. The net result was an average of sixty tubes per saw, and the reason lay in the fact that the saw without set had just the additional amount of bearings on the narrow edge of the metal it was cutting to keep it from digging in and losing all its teeth. Saw blades are saw blades, but the engineer and the agent thereby learned that there are many kinds to the saw blade game, and regulated their buying and use accordingly.

Very few purchasing agents have the time to stop long enough in their rush of daily work to consider the set in the teeth of a saw blade, nor would it ever occur to many of them that it makes any difference. As a matter of fact, how could the agent be expected to think of this small point when the engineer could not pick it out himself without the help of the specialist representative.

The importance of the point lies in the fact that the engineer had the opportunity to see the operation of the article and question it, and that he made use of his connection with the purchasing agent to secure some one who would put things on the right track.

Purchasing equipment and then getting it into operation are often widely separated steps in the modern plant. The agent may find some machine or labor-saving device that he knows needs no consultation with the engineer, and knows that it would be of material assistance to production. He will, though, if he is playing the game, call the engineer in and tell him about the find and arrange with him to see that it is installed to advantage when it arrives, and that the tests are carried through as they should be and that the article itself is sold to the men who are to use it.

Very often it happens, in those plants where there is a lack of close cooperation between the two departments, that the agent knows he is only wasting money to purchase an improved article for the simple reason that he cannot get into the shop and sell its advantages so it will even be used. In the old days he could, but by the very nature of present day requirements on his job he has been forced to delegate that duty to others.

Electric rivet heating and the possibilities involved came to the attention of the engineer through the agent. They worked together on the subject and secured an appropriation to cover the complete change-over in the assembly department where some twenty oil furnaces were in operation. The engineer was able to point out the possible savings and the agent obtained favorable terms from the makers of the equipment so that they were able to present an alluring report to the management, even though the total amount of money involved was high. Purchase orders were made out and the business placed. Here the purchasing agent was through after he had secured the delivery and arranged for the proper payments. The engineer had just begun, however, and from the day the heaters were received, to the time they were in hundred per cent operation, he had made a dozen different plans and presented them to the shop before he was able to hit on the one that would convince the operators that they should be willing to give the new way a trial and find out for themselves that they could benefit as well as the company. Today if any attempt were made to remove the electric heaters and place oil in their stead there would be an uproar.

The point of interest here lies in the fact that without the engineer the agent could never have succeeded in getting the heaters started in production, and without the purchasing agent's ability to secure favorable terms on the transaction, the engineer could not have hoped to secure the necessary appropriation. In short, action on the part of either that would savor of anything but the closest team work would have eliminated the final $300 a month saving which was effected.

Any individual, no matter what his point of control may be in a plant, if left to himself will tend to swing first all one way and then all the other, and it is impossible for any one individual to get the best result without a check from some outside source.

Word had gone out that only the best was to be bought by way of supplies for an extensive hydraulic system. This order with the authority of the production department backed by the management, was placed on account of the excessive loss of production time due to break-down and failures in certain parts of the system. One of the principal points of trouble was in the hydraulic operating valves, where there were four gaskets to each valve which, due to the contruction, had to pass open ports each time they were moved. These gaskets lasted on an average of eight hours of continuous service, and when the best grade was obtained, cost something over a dollar each. When it is stated that there were some forty valves and that the plant operated twenty-four hours a day, it can be seen that the expense was considerable. The agent knew from the requisitions coming across his desk that the gaskets were failing, so it was natural that he should feel they were at fault and increase the price and quality of the grade purchased.

The engineer out in the shop, however, found that he could not keep his pump valves, which were made of bronze, from breaking under the great pressure and getting into the line. He knew that these small pieces of bronze protruding through the ports of the valve were cutting the leathers and would continue to cut them regardless of their grade. He therefore got in touch with the agent and made his report to the end that the cheapest gasket made was substituted at a price of about fifty cents, and used until he and the agent could locate and install a bronze that would not break within a reasonable time. Together, the agent locating bronze sources and the engineer testing each make as it arrived, they were able to find one that stood up very much beyond their expectations. This was installed in all the thirty pumps and the results observed.

It was found that it would be unnecessary to go back all the way to the best grade of gasket after this bronze was in service and a compromise was hit at around seventy cents, which would give excellent service.

Together, they had once more saved about $100 a day, without taking into consideration the increased production possibilities. Again it can be seen that had the agent been unwilling to bank on the word of the engineer and to play with him to the limit, or had the engineer been content to let the agent follow the letter of the order of best materials, very little, if any improvement, could have been realized.

Almost an unlimited number of examples could be given to illustrate the points in question. The foregoing, however, will probably suffice to bring similar conditions to the minds of the readers, and a brief summing up can serve to emphasize the importance of the engineer-purchasing agent combination, to the welfare of their company.

From the standpoint of management their contacts with the outside are fully as important to the company's standing as is the conduct of that company's direct selling organization. They can work together and act judiciously toward the outside salesman, getting results that in many cases are remarkable, or they can act at cross purposes and put their firm in very bad repute indeed. The management, furthermore, can know without investigation that the degree of good or bad accomplished depends directly on the thought management has given to the subject and the care they have exercised in establishing rules of order.

From their own outlook they can appreciate the fact that either is almost helpless without the assistance of the specialized knowledge and ability of the other. They can work together and build their positions up to the point of company importance as great as any department answering to the management directly, or they can feel that each is sufficient unto himself and stay in the position of secondary consideration, from which once in, it is exceedingly hard to emerge.

The word "cooperation" is a much over-worked one, and will not be used in this connection, for, as a matter of fact, in order to obtain all that can be obtained, the agent and the engineer must do more than cooperate—they must be a part of each other. They must be able to go to that point where stops their individual authorities based on their respective qualifications, and they must be able to stop there with the unquestionable knowledge that the other will take hold and carry through.

If they can do this, neither need worry about the fact that his department started out as secondary in importance to others, for management will be utterly unable to place them anywhere but up at the front, the point toward which both are striving. A word at the council table and a voice in the business is a great deal better than the routine filling of requisitions placed and of repairing broken equipment as it breaks.

"There is nothing so good that it cannot be improved upon," providing facts can be made to replace opinions and the solution found in the assembly of those facts.

DISCUSSION[1]

IT may not be generally recognized that the National Association of Purchasing Agents has applied scientific principles in the solving of its major problems. I think, therefore, it would be well to tell you, of the TAYLOR SOCIETY and our guests, of some of our more important aims, growth and accomplishments.

The fundamental objects of the association can be classified, generally, as follows:

1. Associating and organizing individual purchasing agents and buyers into a centrally organized body.
2. Fostering and promoting friendly relations between members with the resulting privilege of exchanging ideas and opinions.
3. Familiarizing the members with the products they buy.
4. Securing more uniform purchasing routine and methods.
5. Standardization of specifications, classifications, etc.
6. Gathering and disseminating data relating to the general subject of purchasing.
7. Improving existing methods for the diffusion of market information.
8. The support of domestic industry.

The National Association of Purchasing Agents was organized in New York City in 1917. It has not quite completed its sixth year of activity. Starting with a membership of approximately two hundred, it has grown so that today the roster shows a little over four thousand members. The National body is composed of forty-two affiliated associations, three of which are in Canada.

While a large part of the period of association existence has been spent in formative work, it has among its records of accomplishments, the following:

A Standarized Catalog Size. Just a glance at any purchasing agent's catalog file will show the need of uniformity of size. This catalog standardization idea, however, did not originate in the purchasing agents association. Many trade organizations have attempted it, but it remained for ours to push the idea over a line between theory and practice. The national catalog size has been endorsed, among other organizations, by the United Typothatae, and Secretary Hoover's Committee on Conservation in its official, printed report commends our work. One of the largest catalog houses in the country prints only catalogs that conform to the N. A. P. A. recommendations. Also the United States Bureau of Standards has given its approval.

A Standard Invoice Form. This is another visionary idea of long standing which our association has transformed into an actuality. Here our recommendations have the endorsement of the American Railway Association, the National Association of Cost Accountants and others. The U. S. Army and Bureau of Supplies of the U. S. Navy tell us that the standard form contains all the essentials of government accounting requirements.

A Standard Coal Contact Form. We, in Syracuse, are particularly proud of this for the reason that it was conceived within the walls of this room and formulated almost in its present form by one of our committees. To Mr. Mitchell, of The Rome Manufacturing Co., is due great credit for his work on this contract form and for his ability to fight his battles to successful conclusion with men of high standing and reputation in the coal industry. This contract binds both the seller and the buyer to an equitable performance. The "Black Diamond," probably the most active of coal trade papers, editorially expressed surprise that purchasing agents had been able to give consideration to sellers in formulating a contract form.

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[1] By Claude T. Yates, Purchasing Agent, Corona Typewriter Co., Groton, N. Y.

A Standard Form of Contract covering pig iron and fuel oil, is also in more or less general use.

A bill recently passed in the House of Representatives against commercial bribery, contained provisions following precisely the National Association recommendations.

The Western Association of Rolled Steel Consumers which is conducting the campaign against "Pittsburgh Plus," was conceived at a meeting of the Chicago Association.

Many cities, counties and some states, have, as a result of our activities in that direction, instituted central purchasing departments, resulting in enormous economies.

These are only a few of the more important accomplishments. Relief from financial limitations, however, will soon increase the scope of our association activities.

Last, but not least, is the Informashow. The Informashow, conducted by, and at the time of the convention of the National Association, is the result of an idea conceived three or four years ago and brought into being at the last convention in Rochester.

The Informashow is an educational exhibition to enable purchasing agents and other plant executives to become more familiar with the commodities they buy and use, through exhibits of raw materials, processes of manufacture and finished products, explained by competent representatives of the exhibitors. It affords in many cases concrete demonstrations which would otherwise in individual or isolated cases be impractical, if not impossible.

At the Informashow the exhibitor is furnished with the opportunity to meet men who actually do the buying and to demonstrate to them at minimum expense, the value of what they have to offer. In short the Informashow is the place where the exhibitor comes to inform, and the purchasing agent to learn.

In some of the local associations the pooling of purchases has been undertaken with highly satisfactory results. The advantages thus gained may be divided into three general groups:

1. Lower unit costs.
2. The more efficient utilization of materials and supplies purchased, through an interchange of ideas, methods, etc.
3. A method, based upon experience, of selecting the best materials to be so purchased, resulting in the elimination of the necessity of duplication of complete laboratory or physical tests, to determine the merits of any particular material or supply so purchased.

For example, let us consider drills, used in most plants in varying quantities. Each member desiring to pool his purchases, would be able to show the results of his experience with this or that make or kind of drill for certain classes of work. Tabulating the data so collected would quickly indicate what manufacturers or jobbers it would be feasible to negotiate with for the combined requirements.

In the main these pools have been handled by a committee of interested parties. The time expended has been their own and the expenses incurred were borne by committee members. While we may or may not be ready at the moment to undertake this problem, it occurs to me that here in our own association we could most advantageously adopt this pooling plan on a number of commodities more or less common to us all. With the aid and cooperation of the membership of the Taylor Society, this plan could be carried on with resultant economies. I desire to lay emphasis on the need of cooperation of production and engineering departments for the reason that in some instances routines and methods would necessarily need to be altered. The pooling plan is fertile ground for consideration and I hope in the very near future to see a start made. Its limitations are subordinate to its benefits.

Standardization is an endeavor on the part of the Purchasing Agents Association which calls for close cooperation with production and engineering, not to mention designing departments. Here lies one of the most concrete evidences of association work. The results of standardization in certain industries have been astounding and trade in general has been the better for what has already been done. It is for all of us to pull together in this work of standardization, that we may be freed to the maximum from the complexities of special this or that, and reap the benefits of standard products, be they materials, supplies or equipment.

It is more or less true that a purchasing agent is subject to more general cussing by word or pen than any other business executive. The very nature of his position makes this so. In the olden days industrial buying was usually done by several people in the same concern, the extent of which depended upon the materials or supplies a certain department might be interested in. During the past decade, the wisdom of centralization of purchasing has demonstrated its effectiveness and has, for the most part, become universal. During the transition period from the old to the new, the relinquishing of purchasing authority by the many to the one, has left open sores, sometimes slow in healing.

A purchasing agent has to buy according to the needs of his particular firm from specifications which should originate in the factory. For the most part there are many sources whence these needs may be supplied. His purchases being limited to the requirements of the business, he cannot, obviously, buy from all who seek the orders he has to place. He is shot at for this reason, thoughtlessly, from without and from within, on general principles; sometimes hit and sometimes missed, all of which he must absorb with a smile, otherwise he is a "grouch" or a "crook," according to the point of view.

Nevertheless, a purchasing agent is just an ordinary human being, possessed of certain definite knowledge, principles and policies concerning his profession, his concern and himself. To a large degree the success of a purchasing agent, outside his personal qualifications, depends largely upon his ability and desire to render to and receive from his associates, cooperation to the fullest extent. Equally important is the manner in which he may be permitted by the management to solve the problems with which he is constantly confrontd by virtue of his position. During the past few years purchasing methods have been greatly improved, and I think you will agree with me that this has been largely due to the purchasing agents themselves. Until recently—and here the purchasing agents association has been a considerable factor—they have not been recognized as a distinct and separate class of business men.

As an example that management is beginning to consider purchasing agents as important executives instead of more or less in the nature of super-clerks, I desire to quote from a paper read by Mr. C. F. Brown, General Manager of the Corona Typewriter Co., Inc., before the Syracuse Association upon the occasion of their visit to the Corona plant. Mr. Brown said:

"I believe that the necessary thought and attention has not been given by management to the problems which the purchasing agent has to meet and the difficulties with which he is beset. I believe that every man in such position, properly encouraged and aided, is only too anxious to do his best for his house, to be a real help to his brother workers, and to treat outsiders who come to see him in a fair and just manner; but how often does the manager take pains and time to go over policies as fully and freely with his purchasing agent as he does with his other department heads with whom he is in almost daily contact, and with whom, as a result, there is constant interchange of ideas. How often does he emphasize to the other departments the importance of the purchasing agent and to indicate the great help, which, properly conducted, a purchasing department may be to them."

Summarizing his paper Mr. Brown closed with the following:

"The purchasing agent of tomorrow will be broad, fair-minded and possessed of tact and courtesy; he will have depth and vision. Given the incentive, clothed with the proper authority, encouraged, supported and helped in his work to the same degree as is done with other executives, he will be found to have developed into one of the most valuable and generally all around, useful men in the organization."

I have mentioned that specifications for various factory requirements should originate in the factory. Who, except those responsible for the operation of the plant and the quality of the work produced, should be permitted to exercise this prerogative? I contend, however, that once these specifications are established, that contact on the part of the factory in actual buying is erroneous, except when requested by the purchasing department. The purchasing agent should be left free, from this point on, from factory interference. No one thing is so detrimental to central purchasing as for salesmen to be permitted or encouraged to avoid the purchasing department.

In such articles as we read on purchasing, much stress is laid upon the value of courtesy to salesmen. While without question this is of extreme importance, to my mind courtesy on the part of purchasing agents to production and engineering in all their departments is equally important.

A purchasing agent of the right sort should know in a general way, the requirements, routines and methods of all the departments into which the business may be divided and in the case of the more important ones this knowledge should be of an intimate nature. He should have a general technical knowledge with respect to the materials used, and in addition the processes through which such material subsequently passes. He should be able at any time to go into conference with other department heads on technical subjects. By frequent conferences between purchasing and production departments a much better understanding of each others